U.S. Environmental Protection Agency
Office of Waste Programs Enforcement
Contract No. 68-W9-0009

BOEING AEROSPACE AND ELECTRONICS PLANT 2
SEATTLE, WASHINGTON

PRELIMINARY ASSESSMENT REPORT
RCRA FACILITY ASSESSMENT

TES 12

Technical Enforcement Support at Hazardous Waste Sites Zone IV Regions 8, 9, and 10

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PRC Environmental Management, Inc.

WA 6819
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BOEING AEROSPACE AND ELECTRONICS PLANT 2
SEATTLE, WASHINGTON

PRELIMINARY ASSESSMENT REPORT
RCRA FACILITY ASSESSMENT

76

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

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EPA Region	:	10
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BOEING

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January 7, 1992

Ms. Marcia Bailey
U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, HW-104
Seattle, Washington 98101

Subject: Technical Enforcement Support, Zone 4
Contract 068-W9-0009
Work Assignment R10018
Boeing Plant 2 Preliminary Assessment

Dear Ms. Bailey:

PRC Environmental Management, Inc. is pleased to submit the Preliminary Assessment Report and draft notification letter for the Boeing Plant 2 facility. An electronic copy of the notification letter in WordPerfect 5.0 is enclosed for your use.

If you have questions please contact me at 624-2692.

Sincerely,

Kit Walther

Kit Walther
Project Manager

KW/se
Enclosure

cc: Vicky Tapang, EPA Regional Project Officer

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1.0 INTRODUCTION

PRC Environmental Management, Inc. is conducting a Resource Conservation and Recovery Act (RCRA) facility assessment (RFA) at the Boeing Aerospace and Electronics Plant 2 (Boeing Plant 2) facility in Seattle, Washington. The first step of the RFA is documented in this preliminary assessment report, which is based on the initial review of information on file at the offices of the Washington Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) Region 10.

1.1 PURPOSE AND SCOPE OF THE RCRA FACILITY ASSESSMENT

The 1984 Hazardous and Solid Waste Amendments to RCRA authorize EPA to require comprehensive corrective actions for solid waste management units (SWMU) and other areas of concern at hazardous waste management facilities, particularly those facilities applying for RCRA permits. These corrective actions are intended to address unregulated releases of hazardous constituents to air, soil, surface water, and groundwater, as well as the generation of subsurface gas.

As a major feature of the EPA corrective action program, the RFA has the following purposes (EPA, 1986):

- Identify and gather information on releases at RCRA regulated facilities
- Evaluate SWMUs and other areas of concern for releases to all environmental media, and evaluate regulated units for releases to media other than groundwater
- Make preliminary determinations regarding releases of concern and the need for further actions and interim measures at the facility
- Screen those SWMUs that do not pose a threat to human health and the environment from further investigation

The three basic steps of an RFA consist of 1) a preliminary review of existing files and other generally available or requested information, 2) a visual site inspection to confirm information and obtain additional information on past and potential releases from SWMUs, and 3) a sampling visit, when warranted, to fill information gaps by obtaining field and analytical data.

1.2 PURPOSE OF THE PRELIMINARY ASSESSMENT REPORT

This preliminary assessment report presents an overview of facility operations, wastes managed, and preliminary identification of SWMUs. The report is used to help plan the visual

site inspection of the facility and determine additional information needs to prepare the RFA report.

2.0 FACILITY DESCRIPTION

Boeing Plant 2 is a fabrication facility for the Boeing Aerospace Company. The parts that are manufactured at Boeing Plant 2 are used in the Aerospace Research and Development and Commercial Airplane Divisions. The corporate headquarters for the Boeing Company is also located at the Boeing Plant 2 site (Ashley, 1989).

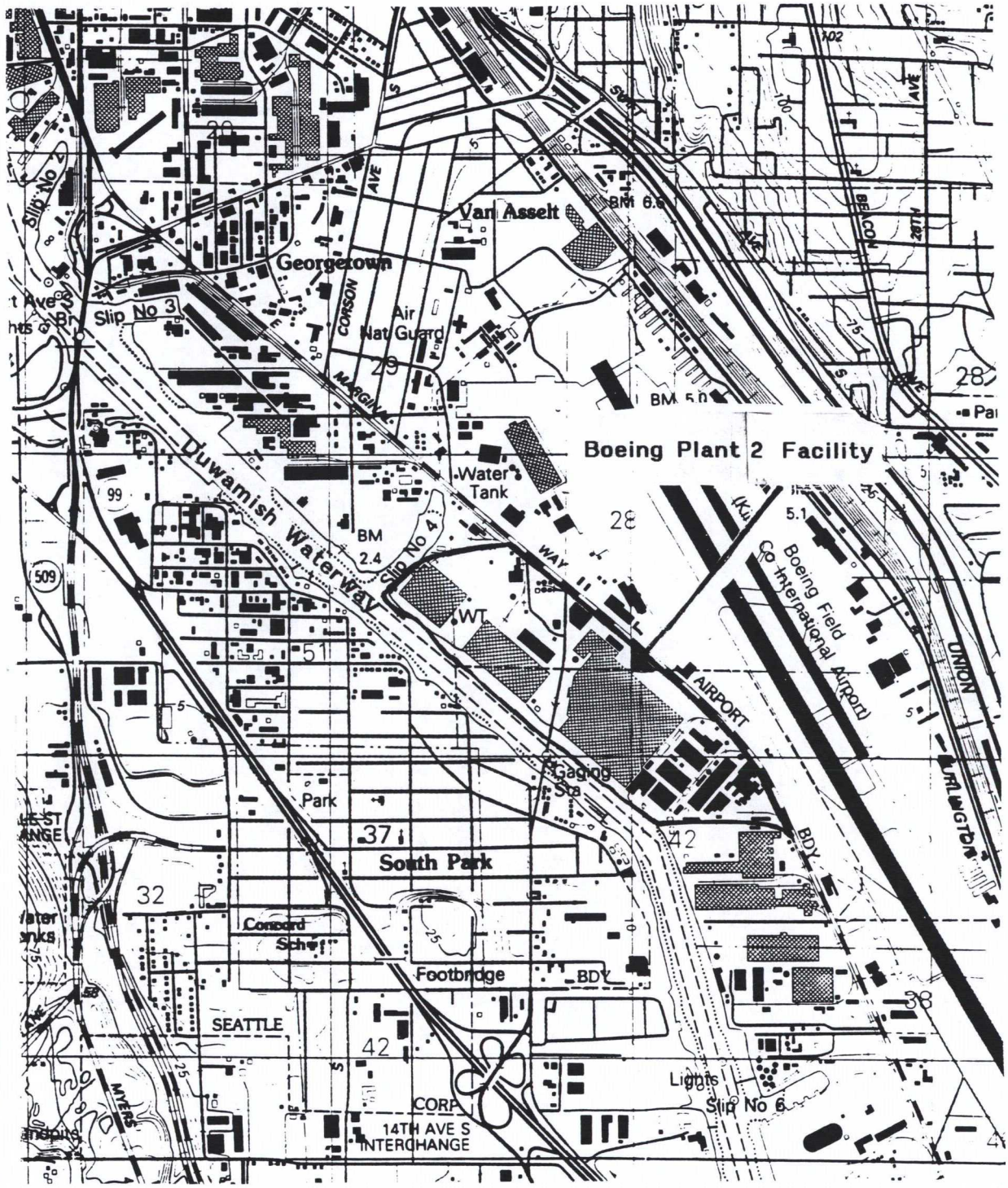
2.1 LOCATION AND OWNERSHIP

Boeing Plant 2 occupies 107 contiguous acres at 7755 East Marginal Way South, in Seattle, Washington (Figure 1). The site is bounded on the west by the Duwamish Waterway, on the north by Webster Street, on the east by East Marginal Way, and on the south by the Jorgenson Corporation. All operational areas of Boeing Plant 2 (Figure 2), except the 2-08 building are secured by continuous chain-link fencing. The 2-08 building is secured from unauthorized entry by worker surveillance (Ashley, 1989). Table 1 is a key to the buildings shown in Figure 2.

2.2 FACILITY PROCESSES

At Boeing Plant 2, aluminum, steel, and titanium parts are made for aircraft built at the Boeing-Renton and Boeing-Everett plants in the northwest area of Washington (Ashley, 1989). Manufacturing operations involve machining, forming, heat treating, plating, coating, and painting the aluminum, steel, and titanium parts. Approximately 4,500 tons per year of hazardous waste comprising spent halogenated and nonhalogenated solvents; plating solutions containing cyanides, ignitables, and corrosives; and waste streams containing chromium are generated at Boeing Plant 2 (Ecology, 1985). Hazardous wastes are containerized and temporarily stored at the facility before being shipped off-site by a hazardous waste transporter for disposal. On-site, the containerized hazardous wastes are temporarily stored at 140 satellite, 60 accumulation, and six central hazardous waste staging areas.

Hazardous waste can potentially be generated at any of a number of process areas at Boeing Plant 2. Satellite areas are located at or near any point of generation where wastes initially accumulate. Up to 55 gallons of hazardous waste or 1 quart of acutely hazardous waste are stored in a container at each satellite area after generation. Satellite areas must be at least 50 feet apart. Wastes are immediately transferred to accumulation areas after the maximum volume



SCALE

500 0 1000 meters

1000 0 2000 feet

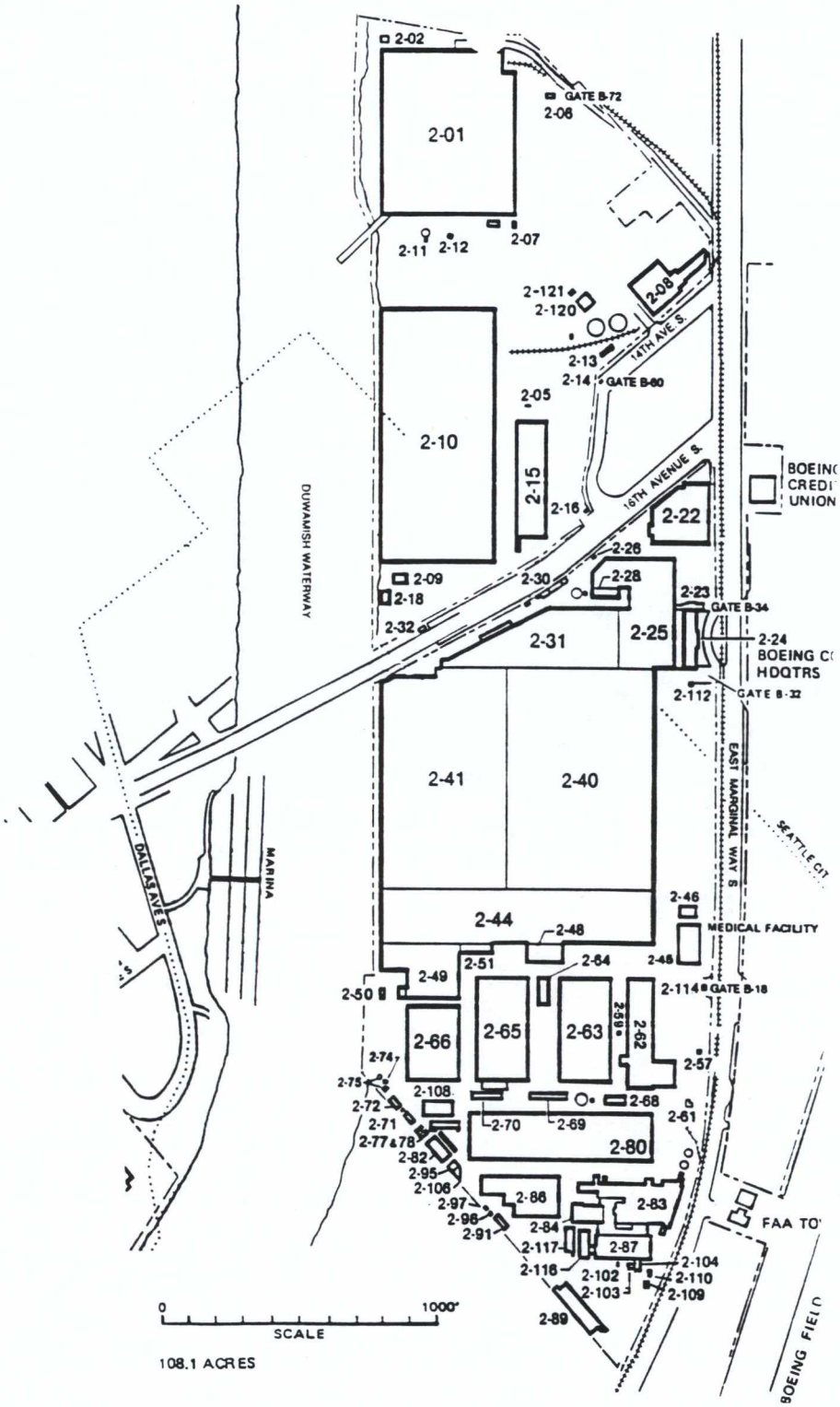
Modified from U.S. Geological Survey

Boeing Plant 2
Seattle, Washington

Figure 1

Facility Location

PRC ENVIRONMENTAL MANAGEMENT, INC.



Boeing Plant 2
Seattle, Washington

Figure 2

Buildings at the Facility

PRC ENVIRONMENTAL MANAGEMENT, INC.

Source: Johnson, 1989

TABLE 1

DESCRIPTION OF UNITS AT BOEING PLANT 2 FACILITY
Source: Boeing, undated

Building Code	Building Title
2-01	Laboratory and Office Building
	First Floor
	Mezzanine
	Balcony
	Second Floor
2-02	High-Temperature Test Cell
2-03	Chiller House
2-05	Gas Pump Building
2-06	Guard House 2-01 Ramp Gate
2-08	Dennison Manufacturing Building
2-09	Butler Building
2-10	Material and Fabrication Building
	North Half
	South Half
	Balconies
2-11	Water Pump House - North Property
2-12	Acid Storage Building - North Property
2-13	Oil Pump House - North Property
2-14	Guard House Gates B-60 and B-62
2-15	Plant Services Terminal Building
	First Floor
	Balconies
2-16	Guard House Gates B-56 and B-58
2-18	Acid Storage
2-19	Guard House Gate C-16
2-22	Cafeteria Building
2-23	Guard House Gate B-34
2-24	Administration Building
	Basement
	First Floor
	Second Floor
	Third Floor
2-25	Engineering Building
	Basement
	First Floor
	Second Floor
	Third Floor
	Fourth Floor
	Fifth Floor
	Penthouse
2-26	Guard House North Clock
	Aisle Gate B-42
2-27	Emergency Generator Building
2-69	Services Support Building
2-70	Sandblasting Building
2-71	City Light Substation
2-72	Steel Storage Building
2-74	Steel Yard Only
2-75	Trichlorethylene Storage Building
2-78	Cement Storage Building
2-80	Annex D
	First Floor
	Balconies
2-82	Paint Storage Building
2-83	Aerodynamics Building
	Basement
	First Floor
	Second Floor
	Second Floor Mezzanine
2-84	Wind Tunnel Annex
2-86	Foundry Building
2-87	South Service Building
	First Floor
	Balcony
2-89	Salvage Building
2-95	Refrigerated Storage Building
2-96	Radioactive Waste Vault
2-97	Radioactive Waste Vault
2-28	North Boiler House
2-29	North Pump House
2-30	North Electrical Equipment House
2-31	North Warehouse
	First Floor
	Balconies
2-32	Dispatch Station
2-34	Guard House - Boeing Computer Center
2-35	Boeing Computer Center
	First Floor
	Second Floor
	Penthouse
2-40	Final Assembly Building
	First Floor
	Mezzanine
2-41	Primary Building
	First Floor
	First Floor Mezzanine
	Second Floor
	Second Floor Mezzanine
2-43	Tunnels and Underground Areas
2-44	South Warehouse
	First Floor
	Balconies
	Mezzanine
2-48	Factory Material Handling Terminal and Storage
2-49	Jig Erection Building
	First Floor
	Second Floor
2-50	Maintenance Storage
2-51	Box Storage and Shoring
2-52	Beryllium Waste Storage Building - Ref. Only
2-57	Guard House
	South Clock Aisle
2-59	Flammable Storage Building
2-61	South Electrical Equipment Building
2-62	Camouflage Building
2-63	Support Building
	Annex A
	First Floor
	Balcony
2-64	Compressor House
2-65	Annex B
	First Floor
	Balcony
2-66	Annex C
2-68	South Storage and Pump House
2-98	Guard House Gate B-6
2-99	Plant Services Maintenance Building
2-102	Dunnage Storage Building
2-103	Bottled Gas and Acid Storage
2-104	Hazardous Waste Storage
2-106	Oil Storage Building
2-108	Plant Services Paint Building
	First Floor
	Second Floor
2-109	Hypersonic Wind Tunnel
2-110	Compressor Building
2-112	Guardhouse Gate B-32
2-114	Guardhouse Gate B-18
2-115	Material Handling Dispatch
2-116	Wind Tunnel
	First Floor
	Second Floor
2-117	Compressor House
	First Floor
	Second Floor
2-118	Car Unloading Facility - Ref. Only
2-282	Production Sandblasting Building

has been accumulated at the satellite area. At the accumulation areas, 55 gallons or more of hazardous waste is stored for up to 60 days before it is transported to the central hazardous waste staging areas. No hazardous wastes are disposed of on-site.

Waste streams from Boeing Plant 2 are typically spent solvents from degreasing, painting, and paint stripping; electroplating solutions; metal finishing and photochemical processes (Table 2).

2.3 REGULATORY HISTORY

In 1980, the Boeing Company notified Ecology of hazardous waste activity at Boeing Plant 2 and submitted a Part A Hazardous Waste Permit application to EPA. On October 22, 1981, EPA issued a determination to Boeing Plant 2 that as owner and operator of a hazardous waste management facility it had met the requirements of Section 3005(e) of RCRA for interim status. On June 30, 1984, Boeing was issued a Dangerous Waste Permit by Ecology authorizing operation of a hazardous waste storage facility at the Boeing Plant 2 facility. In 1988, the facility submitted a Part B Hazardous Waste Permit application to EPA.

2.4 HISTORY OF RELEASES

From 1940 to 1969, Boeing reportedly disposed of aircraft manufacturing wastes such as metal finishing rinses from the Boeing Plant 2 facility into the Duwamish River. A detailed history of this time was not available from the files.

A history of releases from 1966 through 1989 is listed in Table 3. The list may not be complete.

3.0 ENVIRONMENTAL SETTING

Boeing Plant 2 is located in an industrial area of the Duwamish Waterway south of Harbor Island. The following sections describe the general environmental setting of the Boeing facility.

3.1 TOPOGRAPHY AND SURROUNDING LAND USE

Boeing Plant 2 is located on the Duwamish Waterway about 2.5 miles upstream of the mouth. The original topography of the lower Duwamish River valley, including the Boeing Plant 2 site, has been extensively modified since 1918. In 1918, the Duwamish River was channeled to

TABLE 2

HAZARDOUS WASTES GENERATED AT BOEING PLANT 2

Waste Description	Use/Origin	Waste Characteristic	Possible Waste Code RCRA	Ecology
Flammable solvents	Parts cleaning paint stripping	Ignitable (flammable, combustible), determined by flashpoint	D001, F003, F005	
Flammable adhesives, sealants, and paints	Paint shops, Composite shops	Ignitable (flammable, combustible)	D001	
Corrosive metals, cyanides, acids, and caustics	2-10, 2-41, and 2-31 Plating and Metal Buildings	Corrosive, toxic	D002, D007, F007	WT02
Chlorinated solvent	Degreasing	Toxic	F001	
Combustible waste	Machinery oil hydraulic fluids	Ignitable	D001	WT02
Wastewater effluent	2-09 Bldg. Ion Exchange Evaporator	Corrosive, toxic	D002	WT02
Process waste laboratory chemicals	Laboratories	Various	Various	Various

RCRA - Resource Conservation and Recovery Act

Ecology - Washington Department of Ecology

TABLE 3
(Page 1 of 5)

HISTORY OF RELEASES AT
BOEING PLANT 2

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
7/27/66[1]	2-31 building	Metro sewer	Chrome/nitric acid	1,500 pounds	Circulating pipe ruptured discharging process tank contents to Metro sump
7/19/67[1]	2-41 building	Metro sewer	Chromic acid	25 pounds	Tank overflowed to Metro sump
4/16/68[1]	2-10 building	Metro sewer	Chromic acid	Not known	Tank overflowed to Metro sump
1/16/69[1]	2-10 building	Metro sewer	Chromic acid	Not known	Tank overflowed to collection sump - leaked into Metro sump
1/19/69[1]	2-41 building	Metro sewer	Chromic acid	Not known	Steam coil leak
8/3/72[1]	2-41 building	Storm sewer	Trichloroethylene	Not known	Part fell into degreaser tank, punching hole in the tank
1/30/73[1]	South of 2-10 building	Storm sewer	Chromic acid	Not known	Surplus process tank was stored outside. Rainwater washed residue to storm sewers.
10/19/73[1]	2-10 building	Metro sewer	Chrome/sulfuric acid	Not known	Process tank overflowed to Metro sump
6/18/80[1]	2-31 building Roland plating line	Sanitary sewer	Chromic acid	58 pounds	Process tank overflow $500 fine
12/16/80[1]	2-10 building Anodic line	Sanitary sewer	Chromic acid	97 pounds	Steam coil leak

TABLE 3 (continued)
(Page 2 of 5)

HISTORY OF RELEASES AT
BOEING PLANT 2

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
1/3/83[1]	South of 2-10 building	Storm sewer	Chromic acid	0.2 pounds	Waste acid was being pumped to mobile tanker - drain was open
9/22/83[1]	South of 2-01 building	Storm sewer	Lithium bromide	1,000 pounds	Refrigerant leak from water chiller undergoing repairs
4/27/84[1]	2-41 building	Ground soil	Oil/phenol coolant solution	Not known	Spent coolants leaked to the soil through crack in collection sump. Groundwater - 3 ppm oil, 13 ppb phenol, COD 328 mg/L. Minimum effect on groundwater quality.
7/13/84[1]	2-31 building	Metro sewer	Ethylene glycol (antifreeze)	230 pounds	Broken pump casing on chilled water system
7/30/84[1]	2-41 building	Duwamish Waterway	Chrome, copper, zinc	Not known	Process tank located under building overturned, spilling residue to water during removal of tank
11/8/84[1]	2-70 building	Storm sewer	Oil water mixture	Not known	Steam clean receiving sump overflow
11/13/84[1]	2-41 building	Metro sewer	Chrome, copper, lead, cadmium, zinc	177 pounds	Fume scrubber water backflowed to ductwork discharging to sewer
2/1/85[1]	2-66 building	Atmosphere	Trichloroethylene	30 pounds	Small vapor degreaser (50 gallon) exothermic reaction
2/6/85[1]	Salvage yard	Storm sewer	Mineral oil	0	Electric switch leaked in salvage yard - oil was trapped in a retention catch basin and cleaned up

TABLE 3 (continued)
(Page 3 of 5)

HISTORY OF RELEASES AT
BOEING PLANT 2

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
Additional Spills and Violations					
3/23/84[2]	Process area not specified	Ground soil Duwamish Waterway	Emulsified oil	Not known	Leaking machine caused spill
7/31/85[3]	Process area not specified	Ground soil	Trichloroethylene	100 gallons	Construction crew punctured the distribution pipe while trying to install an electric conduit. Action was taken immediately to remove the soil. Clay layer prevented deeper penetration
5/5/86[4]	North end of 2-15 building	Groundwater	Gasoline	Not known	
4/2/87[5]	Process area not specified	Metro sewer	Water with .225 ppm isopropyl alcohol	About 120 gallons/day for an unknown number of days	This was added due to a waste paper watering down process
2/10/88[6]	Process area not specified	Duwamish Waterway	Chromium	Not known	Grab sample identified 3.61 mg/L of chromium. Compliance schedule implemented.
8/4/88[7]	2-41 building	Ground	Nitric-hydrofluoric acid bath	62 gallons of nitric acid, 7 gallons hydrofluoric acid mixed with potable water	Acid spilled to sump below. Many employees were given medical treatment. 28,000 gallons of sump contents were sent for disposal.

TABLE 3 (continued)
(Page 4 of 5)

HISTORY OF RELEASES AT
BOEING PLANT 2

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
4/88[8]	Southwest corner of 2-10 building	Ground	Chromium	Not known	Investigation of leaking second containment plastic liner. Chromium concentration found to be low. Also, it was isolated from groundwater intrusion and infiltration by precipitation since it spilled onto the floor which is composed of concrete.
1/18/88[9]	Southeast corner of 2-15 building	Ground	Bunker C fuel oil	About 50 gallons	Spill occurred during transfer operations. Fuel spilled on pavement and was contained with speedi-dry. Dike was built to protect nearby storm drain. Some fuel reached storm sewers due to heavy rain.
5/26/89[10]	Process area not specified	Air	Nitric acid	Not known	Liner in nitric acid process tank developed a leak. Acid dripped onto a steam pipe and reacted with the steel pipe, which resulted in a steam leak. Assessment was that this was not a major problem.
3/31/89[11]	Process Tank #17 in 2-41 building	Air	Various oxides	Not known	Reaction occurred when titanium alloy was placed in tank containing mixture of nitric acid and hydrofluoric acid. This caused an oxide release to the atmosphere; however, vapors went through a scrubber and exhaust systems. Levels were low enough to create no hazard at the site.
8/16/89[12]	2-01 building	Air	Ammonia vapors	Not known	Unplanned release of ammonia vapors caused by an accidental release of a valve on the manifold system which supplies ammonia to reproduction systems. One employee received medical treatment.

TABLE 3 (continued)
(Page 5 of 5)

HISTORY OF RELEASES AT
BOEING PLANT 2

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
4/23/89[13]	2-41 building	Ground	Sodium cyanide, hydrogen cyanide	750 gallons with less than 1 ounce per gallon sodium cyanide	Copper plating process tank containing sodium cyanide solution overflowed into cyanide sump with some leakage to adjacent acid sump. Threat of hydrogen cyanide gas release when cyanide leaked into an acid sump. 3,125 gallons contaminated with cyanide were sent to Chempro, including spillage to both tanks and water to flush out residual cyanide from acid sump.

1 Bowden, 1985
2 Ecology, 1985
3 Schultz, 1985
4 Healy, 1986
5 Devitt, 1987
6 Lampe, 1988
7 Johnson, 1988a
8 Landau, 1988
9 Johnson, 1988b
10 Schultz, 1989a
11 Schultz, 1989b
12 Archer, 1989
13 Schultz, 1989c

Metro = Municipality of Metropolitan Seattle

COD = chemical oxygen demand

create the Duwamish Waterway. The surrounding valley and lowlands were gradually filled and graded over the next few decades, creating relatively flat topography at Boeing Plant 2. The elevation of the south yard is approximately 19 feet above the mean lower low water level (Landau, 1986).

The area is extensively developed by industry, but also has a population of 25,000 people. Four parks, three schools, and the Boeing airfield are all within 1 mile of the site (Ecology, 1985).

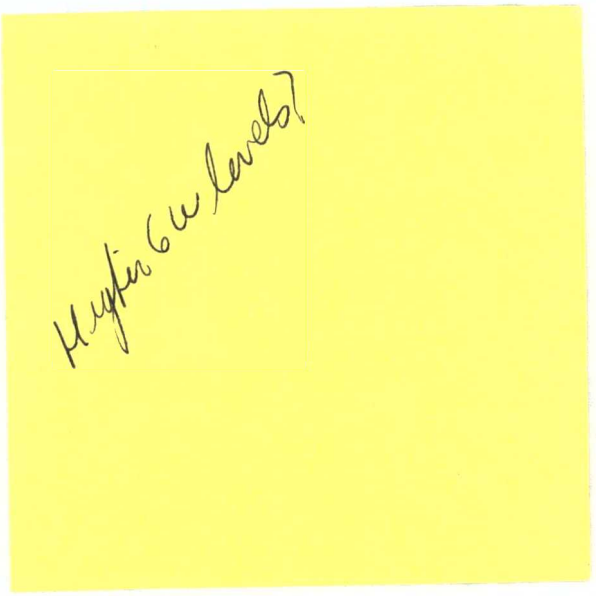
3.2 METEOROLOGY

The site is located within the mild maritime climate of the Puget Sound lowlands. Data collected by the National Weather Service at Seattle-Tacoma International Airport (NWS, 1990) show that average annual temperature is 51.4°F. The coldest month is January (average temperature 39.1°F), and the warmest month is July (average temperature 64.8°F). Annual precipitation is 38.6 inches per year. The Seattle-Tacoma International Airport is located approximately 5 miles south of Boeing Plant 2.

3.3 SURFACE WATER

Surface water near Boeing Plant 2 includes the Duwamish River, the Duwamish Waterway, and Elliott Bay. The Duwamish River begins at the confluence of the Black River and Green River. Twelve miles downstream, the Duwamish River enters Elliott Bay at the northern end of Harbor Island. The Duwamish River drainage area is approximately 440 square miles. Peak flows generally do not exceed 12,100 cubic feet per second.

The Duwamish Waterway generally exhibits a salt water wedge stratification. This stratified water is characterized by two-layer flow, and the bottom salt water wedge has a net landward flow. The salt layer comes from Elliott Bay. The quantity and distribution of salt water which extends into the Duwamish Waterway is a function of river discharge and tidal pumping. The mean landward flow has been reported at mile 1.2 (kilometer 1.9) to be roughly 187 cubic feet per second (5.3 cubic meters per second). Salt water intrusion has been observed as far as mile 10 (kilometer 16) during extreme high tides and low river flow (Harper-Owes, 1983).


Mythen & Legenden?

3.4 GEOLOGY AND HYDROLOGY

The geology at Boeing Plant 2 results from the combination of fill and alluvial deposits. A complex mixture of interbedded sands and silts extends to depths of 60 to 80 feet below ground surface. Fine-grained estuarine deposits that contain shell fragments and other organic material are under this fill and alluvium. Subsurface investigations near the cisterns (Section 4.9) show the upper fill and alluvial deposits to be composed of the following four major soil zones:

- Sand and silty sands (fill)
- Organic silts and clays (original Bay Muds)
- Interbedded sands and silts (alluvium)
- Clean black sands (alluvium)

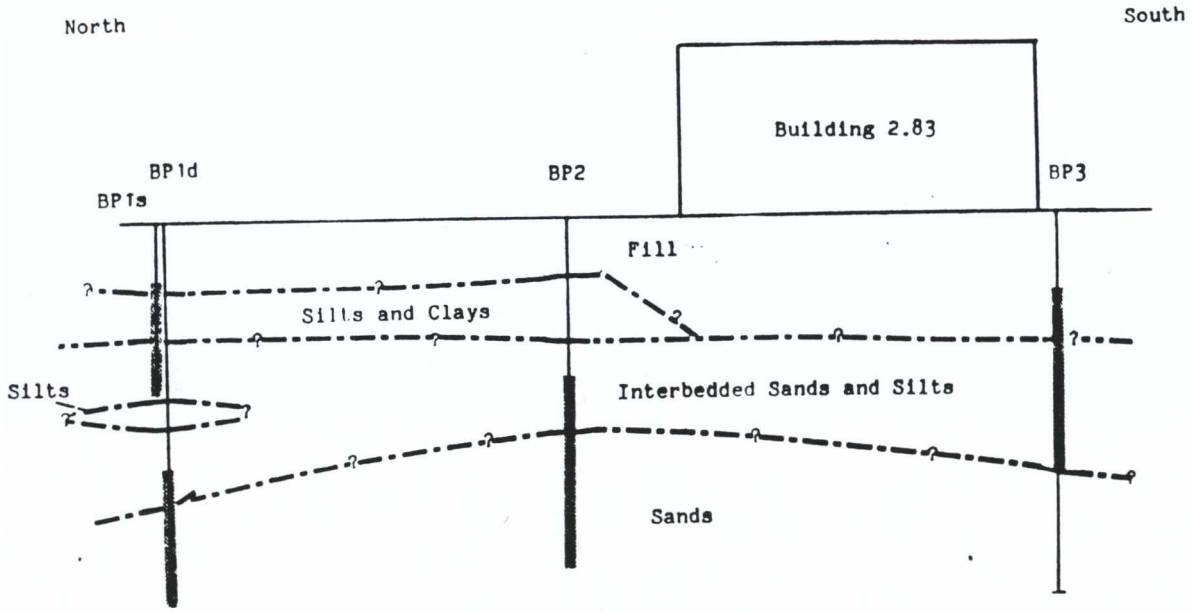
The soils are loose to medium dense. (Landau, 1986; 1987b; 1988). Figure 3 is a geologic cross-section under Building 2-83.

Groundwater level measurements range from 7 to 13 feet below ground surface. The direction of groundwater flow is to the northwest with a gradient of approximately 0.001 to 0.002 feet per foot (Landau, 1987a). Groundwater flows through artificial fill composed of sand, gravel, and clay. Groundwater is not used for drinking within 3 miles of the site (Ecology, 1985).

Groundwater flow direction and gradient may vary due to tidal fluctuations within the nearby Duwamish Waterway and seasonal fluctuations within the groundwater table.

3.5 RECEPTORS

Releases of hazardous waste from Boeing Plant 2 could potentially affect employees at the facility, flora and fauna in and near the Duwamish Waterway, and a select segment of the general population that consumes potentially contaminated fish from the Duwamish Waterway and Elliott Bay downstream of the plant. The general pathways for exposure include air, soil, surface water, and groundwater, in addition to direct contact with spilled materials. It is unlikely that humans are exposed to contaminated groundwater because groundwater near Boeing Plant 2 is not used for drinking water or other domestic uses.



SCALE:

Horizontal 1"=100'

Vertical 1"=8'

KEY:

BP2

Monitoring Well

Screened Interval

Source: Landau, 1986

Boeing Plant 2
Seattle, Washington

Figure 3
Geologic Cross Section

PRC ENVIRONMENTAL MANAGEMENT, INC.

4.0 DESCRIPTION OF SOLID WASTE MANAGEMENT UNITS

The generation of regulated waste can potentially occur anywhere at Boeing Plant 2. SWMU are defined by 40 CFR as "any discernable unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released. A discernable unit includes landfills, surface impoundments, land treatment units, waste piles, tanks, container storage areas, incinerators, injection wells, waste water treatment units, waste recycling units and other physical, chemical or biological treatment units."

The definition potentially classifies the following areas at Boeing Plant 2 as SWMUs:

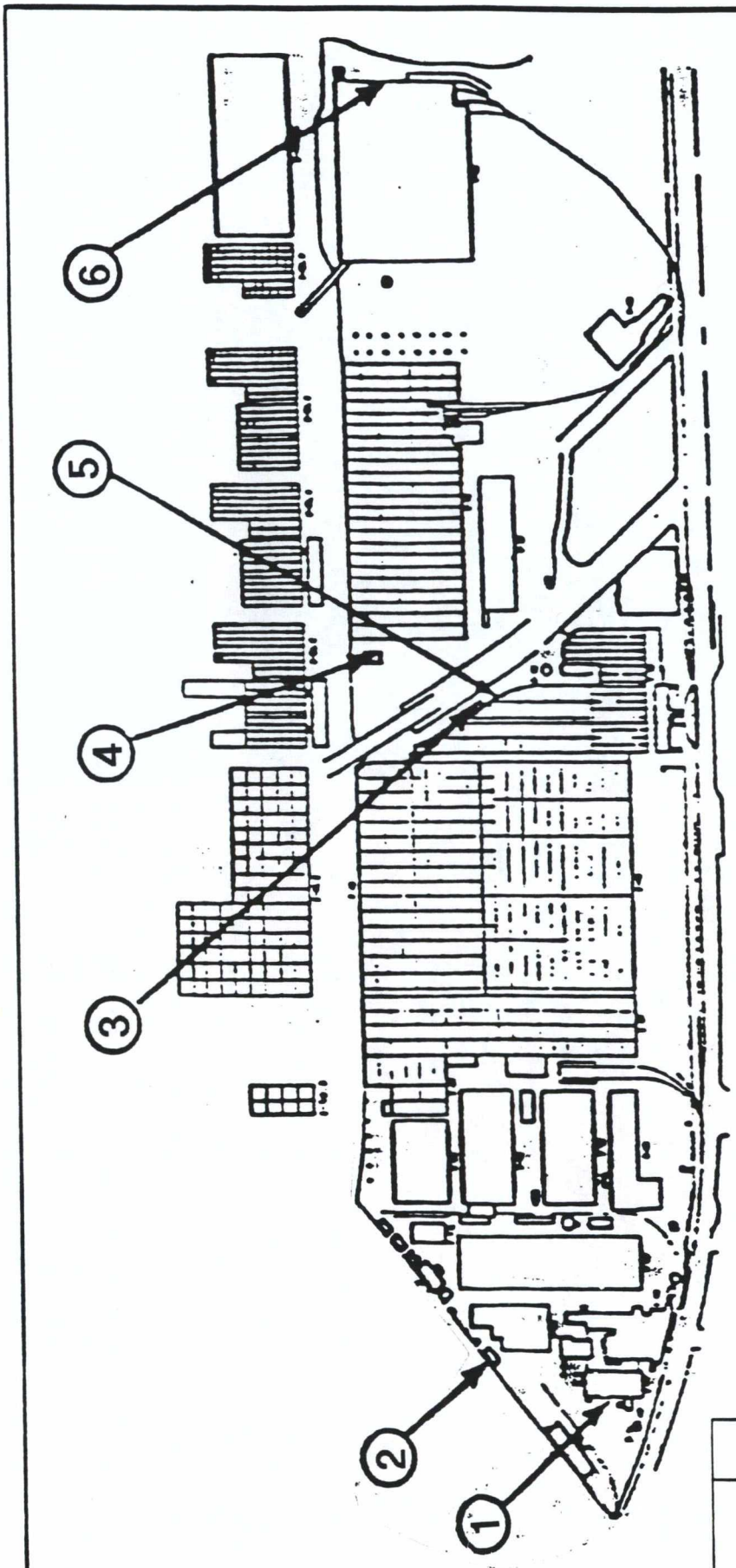
- Individual process areas where routine and systematic releases have occurred, including up to 140 satellite areas and 60 accumulation areas
- Six central hazardous waste staging areas
- Eight oil spill retention basins
- Polychlorinated biphenyl (PCBs) retention tanks at buildings 2-62, 2-64, and 2-110
- Gravity oil separators
- Five cisterns

The six central hazardous waste staging areas (Figure 4) are considered by Boeing as the only RCRA regulated areas under interim status (Fujita, 1990).

The Ecology and EPA files reviewed provide only limited information about satellite and accumulation areas, oil spill retention basins, gravity oil separators, and PCB retention tanks. Most information in the files pertains to the central hazardous waste staging areas and cisterns. For the purpose of this preliminary assessment report, all of the areas identified above are designated as SWMUs and are discussed in the following sections. However, the designation as SWMUs may change after additional information submitted by Boeing Plant 2 is reviewed and after the visual site inspection is conducted.

4.1 SWMU 1 (SATELLITE AND ACCUMULATION AREAS)

Boeing Plant 2 reportedly has 140 satellite and 60 accumulation areas that are used to temporarily store hazardous waste generated by the various facility processes. The operator of



Source: Vigna, 1986

Boeing Plant 2
Seattle, Washington

Figure 4
Central Hazardous Waste
Staging Areas

PRC ENVIRONMENTAL MANAGEMENT, INC.

the process that generates the waste controls the satellite area. Up to 55 gallons of hazardous waste or 1 quart of acutely hazardous waste may be accumulated at the satellite area. From the satellite areas, wastes are transported to the accumulation areas. Fifty-five gallons or more of hazardous waste is stored for up to 60 days at the accumulation areas, after which it is transported to one of six central hazardous waste staging areas. Information is not provided in the files about the location of the satellite and accumulation area incidences of hazardous waste releases, or general structural conditions of the areas where wastes are stored at Boeing Plant 2.

Dates of Operation

The dates of operation were not specified in the files.

Wastes Managed

Possible wastes that are managed at the satellite and accumulation areas are shown in Table 1. A detailed description of hazardous waste labeling requirements, and procedures for handling and on-site transportation from the satellite and accumulation areas is provided in the facility's *Hazardous Waste Management Plan* (Boeing, 1990).

Release Controls

All hazardous waste and hazardous materials are stored in covered, bermed areas that are isolated from all Municipality of Metropolitan Seattle (Metro) storm drains. The secondary containment is large enough to hold 110 percent of the volume of the largest container in the area.

History of Releases

The record of spills (Table 3) shows that releases at the plant have occurred in the process areas and have been associated with process operations and storage or handling of product used in the plant processes. No releases of hazardous waste from the satellite or accumulation areas were found during the file review.

Conclusions Regarding Release Potential

The release control structures and procedures at the satellite and accumulation areas may be adequate to contain potential releases. The integrity of the structures and their maintenance are not described in the project files. The structural integrity of the spill control structures and

evidence of releases will be evaluated during the visual site inspection. Spills could occur because of leaking storage containers or during waste transportation among satellite and accumulation areas. Spills could potentially contaminate soil and groundwater, or be released to the Metro sewer system.

4.2 SWMU 2 (CENTRAL HAZARDOUS WASTE STAGING AREA NUMBER 1)

Central hazardous waste staging area number 1 (2-104 building) consists of a shed to store drums of waste prior to shipment for disposal (Figure 4). Normally, the drums are stored in this area for less than 30 days. Four types of hazardous wastes are stored in separate compartments. Each compartment has a separate 170-gallon containment trench. The containment holds 10 percent of the maximum quantity that may be stored in the area. The drums are bound together and stacked two high on pallets using a forklift equipped with a barrel clamp. Maximum capacity for each compartment is 48 drums.

Dates of Operation

The dates of operation were not specified in the reviewed files.

Wastes Managed

The following four types of wastes are managed at central hazardous waste staging area number 1 :

- Flammable material generated in painting, cleaning, and degreasing operations
- Corrosive and oxidizing materials generated by the laboratory during research and development, small production operations, and maintenance operations are performed
- Poisons generated as a result of removing semisolid impurities and filter materials produced during cyanide plating operations
- Spilled material that collects in the retention sumps and pumped out for disposal

Release Controls

Curbs and spill retention sumps in the central hazardous waste staging area number 1 are used to contain spills. Any spilled material that collects in the retention sumps is pumped out and packaged for disposal. Spills outside of the area are controlled by enacting the spill control plan

outlined in Boeing (1990). The storage area is supplied with plastic tarps and sand to be used for plugging drains and forming dikes. Routine inspections are conducted of the drummed storage area.

History of Releases

No releases from central hazardous waste staging area number 1 were documented in the reviewed files.

Conclusions Regarding Release Potential

Leaking drums could potentially contaminate soil and groundwater. It is not known whether the trenches are lined or not.

4.3 SWMU 3 (CENTRAL HAZARDOUS WASTE STAGING AREA NUMBER 2)

A shed holds tanks of oily liquid waste and free oil in the central hazardous waste staging area number 2 (2-91 building) (Figure 4). Two fixed steel storage tanks with volumes of 2,500 and 1,000 gallons and two portable 500-gallon tanks are housed at this location. Wastes are transported from the place of generation by mobil tankers to the 2-91 building. Lubricating coolants are pumped to the larger storage tanks for later transfer to the disposal contractor's tanker truck. The tanks are constructed of 1/4-inch steel plate. Waste oils are pumped to the two 500-gallon portable tanks for later transfer to an oil-recycling contractor's tanker truck. A coolant separator located in the 2-91 building is no longer active. This system was used to separate oil and water and discharge the water to the Metro sewer. The drain line to the Metro sewer was disconnected in 1975. The tanks are located in a sloped and curbed area to contain any spillage that might occur. The spill collection sump has a capacity of 3,100 gallons.

Dates of Operation

This area was constructed in the mid-1950s.

Wastes Managed

Waste oil in this area is generated by machine shops (coolants), automotive repair shops, and clean out of storm and sanitary sewer oil separators.

Release Controls

The oil is dumped into the sump and pumped to holding tanks. From there, it is pumped to the tanker truck for removal and off-site disposal. Spills within the building will drain to the sump. Spills outside of the building will drain to a sewer system oil separator.

History of Releases

No releases from central hazardous waste staging area number 2 were documented in the reviewed files.

Conclusions Regarding Release Potential

Spills at waste transfer areas and leaks from tanks could potentially contaminate soils and groundwater.

4.4 SWMU 4 (CENTRAL HAZARDOUS WASTE STAGING AREA NUMBER 3)

Central hazardous waste staging area number 3 contains a 6,000-gallon tank (Figure 4); however, the waste-holding capacity is limited to 5,000 gallons. The tank is made of 1/4-inch steel and lined with 1/8-inch thick PVC to contain waste acids from manufacturing processes. There are no automatic level controls on this tank, and the waste handler is responsible for keeping the tank contents below the maximum fill level. A 5,000-gallon retention basin is located below the holding tank. The sump is checked on a daily basis for evidence of tank leaks. Accumulated rainwater that drains to the retention basin from the diked truck-loading area is periodically pumped into the holding tank.

The holding tank and retention basin are pumped out annually to allow for inspection of the tank and the retention basin lining (Vigna, 1986).

Dates of Operation

The holding tank has been in operation for over 20 years. The exact dates were not mentioned in the files.

Wastes Managed

The wastes managed are waste acids from manufacturing processes.

Release Controls

No automatic level controls exist in this tank. A waste handler is responsible for keeping the contents in the tank below the maximum fill level.

History of Releases

No releases from central hazardous waste staging area number 3 were documented in the reviewed files.

Conclusions Regarding Release Potential

Spills and overfilling could occur during the transfer of wastes to the holding tanks and potentially reach soil and groundwater.

4.5 SWMU 5 (CENTRAL HAZARDOUS WASTE STAGING AREA NUMBER 4)

Central hazardous waste staging area number 4 contains a 4,000-gallon tank for holding concentrated chrome waste from chrome-bearing rinse waters. The tank is made of chromic acid-resistant fiberglass approximately 3/16 inch thick (Figure 4). The tank is located inside of the 2-09 building and receives chromic acid wastes that have been concentrated by an evaporator. The wastes are generated by ion exchanges used to purify contaminated rinse waters received from the anodizing process line adjacent to the 2-10 building and wastewater received from a small anodizing operation located in the 2-62 building. Any leaks or spills flow to a waste holding sump located in the 2-10 building. This sump also provides spill retention for the process line.

Dates of Operation

The dates of operation were not specified in the reviewed files.

Wastes Managed

The wastes managed are concentrated chrome waste from chrome-bearing rinse water.

Release Controls

The tank is equipped with both a level controller and high-level alarm and is checked on a weekly basis.

History of Releases

The following releases at or around this area have been documented on several specific dates over the past 23 years:

- Tank overflows of chromic acid in the 2-10 building were reported on April 16, 1968 and January 16, 1969
- Chromic acid residue from the surplus process tank was washed into the storm sewers by rainwater in January 1973
- A process tank overflowed to a Metro sump, spilling a mixture of chromic acid and sulfuric acid in October 1973
- Chromic acid leaked when waste acid was being pumped into a mobile tanker and the drain was left open in January 1983
- A second containment plastic liner leaked, spilling chromium onto the ground in April 1988

Conclusions Regarding Release Potential

Spills occurring during waste transfer operations or resulting from leaking tanks could potentially contaminate soil and groundwater.

4.6 SWMU 6 (CENTRAL HAZARDOUS WASTE STAGING AREA NUMBER 5)

Central hazardous waste staging area number 5 consists of a 1,000-gallon sump within the cleaning facility for aircraft landing gears (Figure 4). Solvents used in the cleaning operations drain onto a sloped floor, which has a grating, and into the sump. When personnel observe that the sump is full, solvent is pumped to the oil/solvent disposal contractor's tanker truck.

Dates of Operation

The dates of operation were not specified in the reviewed files.

Wastes Managed

The wastes managed include cleaning solvents.

Release Controls

The sump has a float-operated high-level alarm that alerts the operating personnel when it is full. The alarm is inspected and the operating condition checked every 30 days. The sump is inspected annually for evidence of leakage. If the sump is overfilled, it will back up into collection trenches. Generally, this area generates approximately 1,000 gallons of waste per year.

History of Releases

No releases from central hazardous waste staging area number 5 were documented in the reviewed files.

Conclusions Regarding Release Potential

Spills occurring during waste transfer operations resulting or from leaking tanks could potentially contaminate soil and groundwater.

4.7 SWMU 7 (CENTRAL HAZARDOUS WASTE STAGING AREA NUMBER 6)

Central hazardous waste staging area number 6 is used for holding spent plating solutions and used laboratory wastes containing cyanide (Figure 4). The cyanide waste is stored and transported by a disposal contractor in 375-gallon containers approved by the U.S. Department of Transportation (DOT). A maximum of four containers are stored in this area at one time. The containers are stored in a covered shed on a grating directly over a 1,500-gallon spill retention basin. This area is also used as a holding area for semisolid cyanide wastes generated on-site. These wastes are subsequently transported to staging area number 1 for pickup by the disposal contractor. The area also stores small containers of liquid cyanide generated by on-site laboratories. These containers, which contain up to 5 gallons, are transferred to the DOT containers prior to disposal (Vigna, 1986).

Dates of Operation

The dates of operation were not specified in the reviewed files.

Wastes Managed

The wastes managed include the following:

- Spent plating solutions from production areas
- Cyanide wastes from laboratory or research and development areas
- Semisolid cyanide wastes generated on-site

Release Controls

Storage containers are DOT-approved. Additionally, all personnel involved with handling these wastes follow the guidelines and precautions for using and handling cyanides (Vigna, 1986).

History of Releases

No releases from central hazardous waste staging area number 6 were documented in the reviewed files.

Conclusions Regarding Release Potential

Spills resulting from leaking storage containers could potentially contaminate soil and groundwater.

4.8 SWMU 8 (OIL SPILL RETENTION BASINS)

Eight oil spill retention basins are located at the Boeing Plant 2 site to intercept and contain oil spills. The basins are described briefly in the spill prevention, control, and countermeasures plan for Boeing Plant 2 (Boeing, 1982). Each basin is identified in the plan by assigned numbers; however, no map was found in the file that identified the locations. There are also a number of inactive retention basins at Boeing Plant 2. A retention basin is considered inactive when there is no longer a high risk of oil spillage.

Retention basin Number 7 intercepts and contains fuel oil or solvent spills that may occur during unloading and handling of drums used in the 2-02 solvent dispensing building. The dispensing area is curbed and has a 500-gallon spill containment sump. Retention basin Number 8 intercepts and contains any oil or solvent spills that may occur in the vicinity of the 2-104

building used for staging of hazardous waste. Retention basin Number 15 intercepts and contains any fuel oil spills that may occur in and south of the 2-15 building boiler room. Retention basin Number 16 intercepts and contains any gasoline spillage that may occur during the fueling of motor vehicles at the gasoline dispensing station located north of the 2-15 building. Retention Basin Number 19 intercepts any spillage from the oil and solvent dispensing rack located east of the 2-82 building, a flammable liquid storage area. Retention basin Number 20 intercepts and contains any gasoline or diesel fuel spillage that may occur during motor vehicle fueling of the fuel dispensing station located south of the 2-44 building. Retention basin Number 21 contains potential overflow or leakage from the two large aboveground fuel storage tanks located west of the 2-08 building. Containment in this area is provided by a 6-foot high concrete dike. Separation of major spillage from either of the two tanks within the retention basin is provided by an 18-inch-high concrete wall. Retention basin Number 22 contains any spills at the railroad unloading area and truck loading and unloading area for the tanks located west of the 2-08 building mentioned in the description of retention basin Number 21. All or some of the retention basins could be considered SWMUs.

Dates of Operation

The dates of operation of these retention basins were not documented in the reviewed files.

Wastes Managed

These retention basins manage overflow wastes that could potentially contain fuel oil, gasoline, diesel fuel, solvents, flammable material, corrosive and oxidizing agents, poisons, and other various hazardous materials handled at the site (Boeing, 1982).

Release Controls

The retention basins are inspected every 30 days, and any fuel oil or solvent found in the basins is pumped out if it exceeds a depth of 3 inches. The inactive basins are not inspected. Retention basins Number 21 and Number 22 may accumulate rainwater. Sump pumps in these basins are used to pump water to the storm sewer. The sump pumps in retention basin Number 21 are checked for signs of any oil spillage and are manually started after a major rainfall. These pumps shut off automatically when the sump is empty. Any water collected at the retention basin Number 22 sump pump is automatically pumped through an oil separator to the storm sewer. In the event of a major spill, the automatic containment sump pump is shut off.

History of Releases

No information was found in the files concerning the history of releases from the oil spill retention basins.

Conclusions Regarding Release Potential

Information in the files is insufficient to make conclusions regarding the potential for releases from the retention basins. Information is not provided in the files about the size, capacity, and integrity of the retention ponds. Operation of the sump pumps in retention basin Number 22 by an attendant suggests some risk of overtopping if a major spill should go unnoticed. Routine inspection of the retention basins, however, minimizes the potential for releases, if problems noted are immediately corrected.

4.9 SWMU 9 (POLYCHLORINATED BIPHENYL RETENTION TANKS)

PCB retention tanks are used to contain spills that may occur from PCB transformers at the 2-62, 2-64, and 2-110 buildings. The tanks are designed to retain the entire contents of each respective transformer in the case of a major leak (Boeing, 1982). The number of tanks is not reported in the files.

Dates of Operation

The dates of operation for the PCB retention tanks were not documented in the reviewed file.

Wastes Managed

The wastes managed are PCBs.

Release Controls

Specific release controls pertaining to the PCB retention tanks were not found in the reviewed file.

History of Releases and Conclusions Regarding Release Potential

No information was found in the files about releases from the PCB retention tanks. Additional information and a site visit are necessary to determine the history and potential for release of PCBs.

4.10 SWMU 10 (GRAVITY OIL SEPARATORS)

At Boeing Plant 2, oil separators are provide when there is a continuous or frequent discharge of oils or greases. The discharge from these separators is routed to the sanitary sewer and is monitored on a weekly basis in order to insure that the oil content of the effluent does not exceed the Metro sewer permit limit for oils and grease.

Dates of Operation

The dates of operation for the gravity oil separators were not documented in the reviewed files.

Wastes Managed

Oil and grease are the wastes managed.

Release Controls

No information is available about removal of oils from the separators and monitoring of the discharges to the Metro sewer.

History of Releases

No information was found in the file about releases from the gravity oil separators.

Conclusions Regarding Release Potential

Releases of hazardous waste to the Metro sewer system could interfere with the biological systems of the treatment plant and possibly be dangerous to people working in the sewer.

4.11 SWMU 11 (CISTERN SUMPS)

Prior to 1955, Boeing disposed of liquid waste chemicals in five 1,000-gallon cistern-like sumps at Boeing Plant 2 (Figure 5). The cisterns were lined with porous brick that were laid without mortar in the vertical joints to allow the liquid to filter to the soil and groundwater. The cisterns were 5 feet in diameter, 7 feet deep, and were located about 1,000 feet east of the Duwamish Waterway.

In September 1986 the cisterns and the surrounding backfill were removed. Chemical testing of soil from the cisterns and surrounding the cisterns was performed. Additionally, the groundwater was tested, and a groundwater monitoring program was implemented. These tasks were implemented for the environmental assessment of the cisterns (Landau, 1987b). However, it is unclear from the information obtained in the file review if the remediation of these cisterns has been successfully completed to date.

Dates of Operation

Cisterns were used at Boeing during the 1940s until 1955.

Wastes Managed

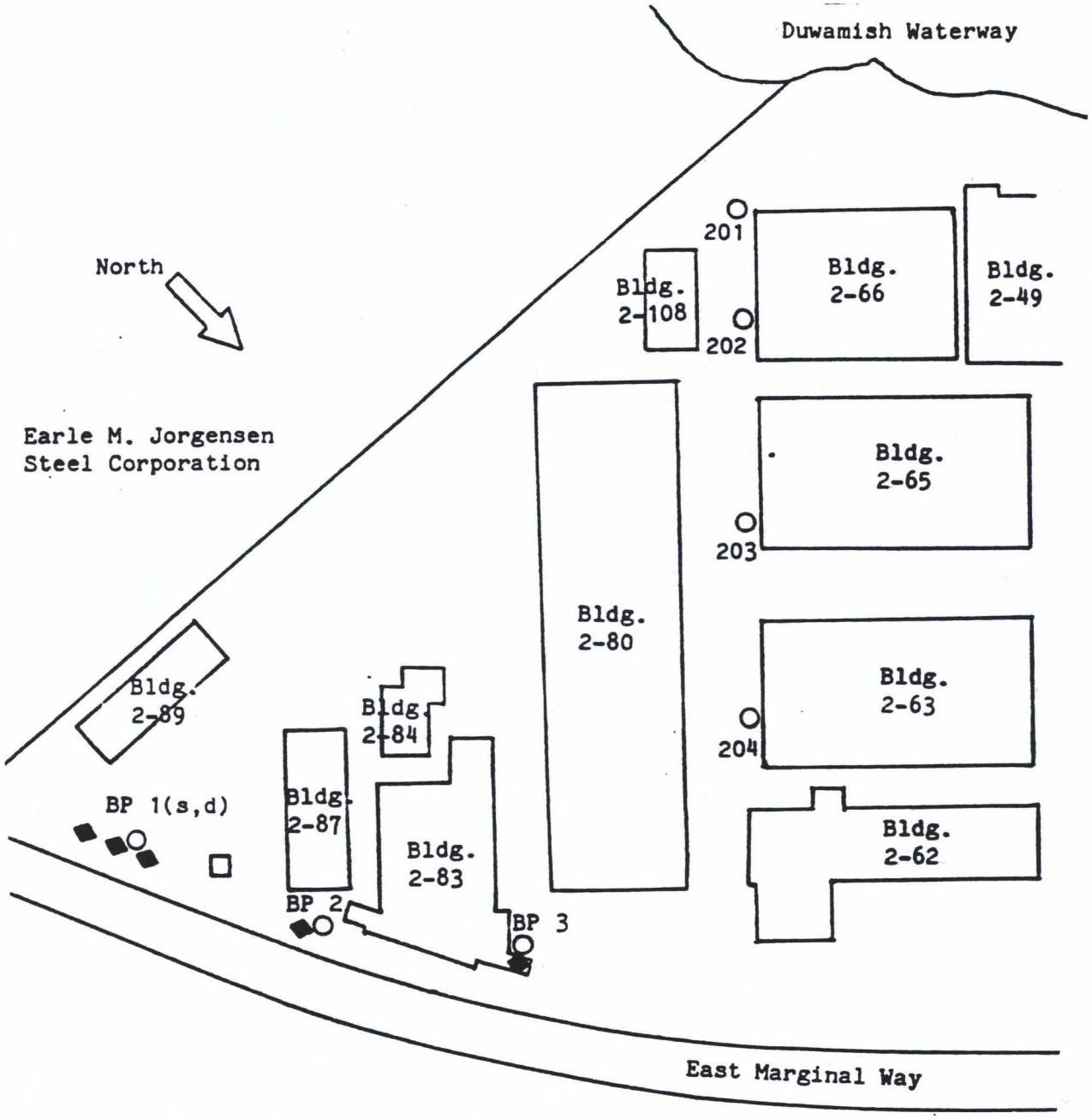
The wastes managed in these cisterns were mildly acidic and alkaline solutions (Landau, 1986).

Release Controls

There were no release controls; wastes infiltrated from the cisterns into soil and groundwater (Landau, 1986).

History of Releases

Wastes dumped into the cisterns infiltrated the soil and groundwater for 10 to 15 years.



Key

201 ○ Monitoring Well
◆ Cistern

Scale: 1" = 250'

Source: Landau, 1986

Boeing Plant 2
Seattle, Washington

Figure 5

Location of Cisterns

PRC ENVIRONMENTAL MANAGEMENT, INC.

Conclusions Regarding Release Potential

An evaluation of the remedial action to close the cistern sumps was not found in the reviewed files. Additional information is needed to make conclusions regarding the potential for releases from the areas where the cistern sumps were removed.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Additional information and a site visit are needed to confirm the designation of SWMUs identified in Section 4 and to determine actual and potential releases of hazardous wastes or wastes containing hazardous constituents at the SWMUs. A request should be made that Boeing Plant 2 provide the following information necessary to complete the RFA report:

1. A flowchart of facility processes showing the following information:

   a. Individual plant processes that generate hazardous waste or wastes containing hazardous constituents

   b. Satellite units at each plant process area that are used to temporarily store hazardous waste

   c. Accumulation areas used to store hazardous waste from each satellite unit

   d. Central hazardous waste staging areas that are used to store hazardous waste from the accumulation areas or directly from the satellite areas

2. A facility map that identifies buildings associated with the facility processes that generate hazardous waste stored at satellite, accumulation, and central hazardous waste staging areas.

3. A narrative description of the flowchart requested in item 1, including dates of operation, wastes managed, waste production rates and quantities, release controls, and records of releases of hazardous waste from these hazardous waste storage areas.

4. Dates of operation for oil spill retention basins 7, 8, 15, 16, 19, 20, 21, and 22. List of other active oil spill retention basins, if any. General engineering design drawings that illustrate capacity and spill control features at each oil spill retention basin. Information on releases from the spill retention basins.

5. The size, capacity, age, and engineering design of each PCB retention tank. A history of releases and explanation of release controls.

6. A facility map showing the location of the PCB retention tanks, oil spill retention basins, and gravity oil separators at Boeing Plant 2

7. An updated spill incidence report for the period of operation of Boeing Plant 2 that specifies the date, location, receiving environment, and type and quantity of spilled material.

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Steph-
Pls prepare this letter but for now leave the blanks blank. Kit Walther of PRC will call you while I'm gone to give you the info for the blanks. Then circulate for signature. thx
marcia

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

~~January 7, 1992~~

Ms. M. Armstrong-Russel, Environmental Manager
Boeing Aerospace and Electronics Division
P.O. Box 3999
Seattle, WA 98124-2499

RE: Visual Site Inspection at Boeing Aerospace and Electronics Plant 2
EPA ID. No.: WAD009256819

Dear Ms. Armstrong-Russel:

Per conversation between _____ and Kit Walther ~~of my staff~~ on _____, 1992, this letter is to confirm a visual site inspection (VSI) of Boeing Aerospace and Electronics Plant 2 (Boeing Plant 2) on _____, 1992, beginning at _____ a.m. The VSI may extend to _____, 1992, if needed.

The VSI will be performed by PRC Environmental Management, Inc. (PRC), a contractor to the U.S. Environmental Protection Agency (EPA). PRC is an authorized contractor of EPA, contract number 068-W9-0009 (CERCLA; Sec. 115), and is acting on its behalf as field investigators. The PRC investigators may be accompanied by a representative from EPA.

This VSI is intended to meet the requirements of the Resource Conservation and Recovery Act (RCRA). The Hazardous and Solid Waste Amendments of 1984 (HSWA) establish the authority in the RCRA program to address releases of hazardous waste or hazardous constituents from solid waste management units (SWMUs). This program applies to operating, closed, or closing RCRA facilities. The RCRA Facility Assessment (RFA) is a mechanism which the EPA utilizes to carry out the corrective action authorities of HSWA.

Specifically, the RFA is the initial step in the corrective action process. In the RFA, EPA identifies all SWMUs at a facility and determines the potential for releases of waste from the units. The corrective action authorities allow the RCRA program to detect and correct releases from regulated waste management units as well as those units resulting from past waste management practices at RCRA-regulated facilities. Releases to all media (air, soil, and surface and groundwater) from all waste units are within the jurisdiction of the RCRA corrective action program. EPA Region 10 is currently responsible for implementing this program in Washington, Oregon, and Alaska; Idaho is authorized to implement its own corrective action program.

EPA is currently conducting a RFA of the Boeing Plant 2 facility. Section 3007 of RCRA, 42 U.S.C. §6927, authorized EPA to request certain information from handlers of hazardous waste. Pursuant to §3007 of RCRA (and to facilitate the RFA process), a list of the information you are to provide is enclosed (Attachment I). The title of the list is RCRA Information Needs. All facility records should be reviewed to obtain the requested information, including the personal recollections of longtime employees and past owners and operators. The requested information must be submitted to EPA within 30 days of receipt of this letter.

Boeing Plant 2 must be aware that the VSI will encompass all processes within the boundary of the entire facility. Therefore your response to the informational needs must address all of the solid waste management units identified in Attachment II, in addition to the six RCRA regulated central hazardous waste staging areas.

Failure to provide the requested information may subject the facility to enforcement action under Section 3008 of RCRA, 42 U.S.C. §6928. Such enforcement action could include the assessment of substantial penalties, up to $25,000 per day for noncompliance. The facility may assert a claim of confidentiality for any information entitled to protection under 40 C.F.R., Part 2, Subpart B, by designating the information you believe is entitled to such protection.

An agenda for the VSI is enclosed, including a schedule, a preliminary list of SWMUs identified during our file review, and a list of RCRA information needs that must be provided within 30 days of receipt of this letter. We will be contacting you in the next 3 weeks to confirm the inspection and make any necessary final arrangements. The inspection process can be expedited if you will provide the information outlined in the enclosed RCRA Information Needs checklist in a precise and timely manner.

If you have any questions regarding this letter or the RFA process, please contact ~~Ms.~~ DR Marcia Bailey of my staff at 553-0684.

Sincerely

Randall F. Smith, Acting Director
Hazardous Waste Division

Enclosures

cc: ~~Ms.~~ Vicky Tapang, EPA Region 10
~~Ms.~~ Marcia Bailey, EPA Region 10
Kit Walther, PRC

ATTACHMENT I

RCRA INFORMATION NEEDS

1. Provide a flowchart of facility processes showing the following information:

   a. Individual plant processes that generate hazardous waste or wastes containing hazardous constituents

   b. Satellite units at each plant process area that are used to temporarily store hazardous wastes or wastes containing hazardous constituents

   c. Accumulation units used to store hazardous waste collected at each satellite unit

   d. Central hazardous waste staging areas that are used to store hazardous wastes from the accumulation areas or directly from the satellite areas

2. Provide a facility map that identifies buildings associated with the facility processes that generate hazardous wastes that are stored at satellite, accumulation, and central hazardous waste staging areas.

3. Provide narrative description of the flowchart information requested in item 1, including dates of operation, wastes managed, waste production rates and quantities, releases controls, and records of releases of hazardous waste.

4. Provide the dates of operation for the oil spill retention basins 7, 8, 15, 16, 19, 20, 21, and 22 and a list of other active oil spill retention basins, if any. Provide general engineering design drawings that illustrate capacity and spill control features at each oil spill retention basin and information on any releases.

5. Provide the size, capacity, age, and engineering design of each PCB retention tank, information on releases, and an explanation of release controls.

6. Provide a facility map showing the location of the PCB retention tanks, oil spill retention basins, and gravity oil separators at Boeing Plant 2.

7. Provide an updated spill incidence report for the period of operation of Boeing Plant 2 that specifies the date, location, receiving environment, and type and quantity of material spilled.

8. Provide any groundwater, air, and soil sampling data collected at the facility.

9. Provide current and historical aerial photographs of the facility.

10. Describe the waste types and handling practices for incoming and outgoing wastes at the facility for each year of operation. Quantify the waste types handled for each year of operation.

ATTACHMENT II

RCRA FACILITY ASSESSMENT
VISUAL SITE INSPECTION AGENDA

FACILITY:	Boeing Aerospace and Electronics Plant 2
EPA ID NO.:	WAD009256819
FACILITY CONTACT:	Ms. M. Armstrong-Russel, Environmental Manager
CONTRACTOR PERSONNEL:	Mr. Kit Walther, Environmental Scientist, PRC Mr. Jim Wright, Environmental Engineer, PRC

PURPOSE OF INSPECTION

The Hazardous and Solid Waste Amendments of 1984 (HSWA) broaden the scope of EPA's authority under RCRA by requiring corrective action for releases of hazardous waste and hazardous constituents at facilities that manage hazardous wastes. The RCRA Facility Assessment (RFA) is conducted to evaluate the potential for releases to the environment and the need for corrective action.

This process includes a preliminary review of available file information, a visual site inspection (VSI) of the facility, and, if necessary, a sampling visit.

The purpose of the VSI is to:

- Identify solid waste management units (SWMUs) and other areas of concern. A SWMU is defined as any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

- Interview site representatives and review or collect facility information provided by site representatives.

- Perform a site walk-through and visual inspection with the site representative.

- Take photographs of the site, including photographs of all SWMUs and other areas of concern. The site representative will be consulted prior to taking photographs that may contain confidential content.

PROPOSED VSI SCHEDULE

Inspection team will meet with Boeing Plant 2 personnel to discuss:

Introductory Meeting

- Purpose of visit
- Agenda
- Safety and health considerations
- Facility history and operations
- Additional information needs pertaining to the SWMUs identified during the preliminary review, including processes which may result in the generation of waste streams.

Inspection Tour

The inspection team will inspect the facility and examine potential SWMUs which are listed below, and have been identified during the preliminary file review. Additional SWMUs and areas of concern may be identified during the inspection based on the team's inspection and review of the facility information.

Meeting

The inspection team will meet with Boeing Plant 2 personnel to conclude the VSI activities.

SWMUs PREVIOUSLY IDENTIFIED:

SWMU 1	Satellite and Accumulation Areas
SWMU 2	Central Hazardous Waste Staging Area Number 1
SWMU 3	Central Hazardous Waste Staging Area Number 2
SWMU 4	Central Hazardous Waste Staging Area Number 3
SWMU 5	Central Hazardous Waste Staging Area Number 4
SWMU 6	Central Hazardous Waste Staging Area Number 5
SWMU 7	Central Hazardous Waste Staging Area Number 6
SWMU 8	Oil Spill Retention Basins
SWMU 9	PCB Retention Tanks
SWMU 10	Gravity Oil Separators
SWMU 11	Cistern Sumps

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PRC

August 7, 1992

Ms. Vicky Tapang
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, HW-105
Seattle, WA 98101

Subject: Boeing Plant 2 Draft RFA Report
Work Assignment R10018
Contract 68-W9-0009

Dear Ms. Tapang:

PRC Environmental Management, Inc. (PRC) is pleased to submit the draft Resource Conservation and Recovery Act (RFA) report for the Boeing Plant 2 facility in Seattle, Washington. Enclosed are two bound copies of the report and a diskette copy in Wordperfect 5.0. One bound copy has been mailed to the Department of Ecology. Also enclosed is the completed corrective action stabilization questionnaire for the facility.

Please contact me at 624-2692 if you have questions.

Sincerely,

K Walther

Kit Walther
Project Manager

Enclosures

cc: Dr. Marcia Bailey, EPA Work Assignment Manager, w/o enclosure
Byung K. Maeng, P.E., Environmental Engineer, w/ enclosure of Draft RFA Report only

Boeing
Original
(for file)

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8-7-92

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Byung K. Maeng, P.E., Environmental Engineer, w/ enclosure of Draft RFA Report only

9266
FILE COPY

BOEING PLANT 2

SEATTLE, WASHINGTON
RCRA FACILITY ASSESSMENT

DRAFT REPORT

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Work Assignment No.	:	R10018
EPA Region	:	10
Date Prepared	:	August 7, 1992
Contract No.	:	068-W9-0009
Site No.	:	WAD009256819
Prepared by	:	PRC Environmental Management, Inc.
PRC Project Manager	:	Kit Walther
Telephone	:	206/624-2692
EPA Work Assignment Manager	:	Marcia Bailey
Telephone	:	206/553-0684

Signature _____ Date:_____

_____ This report requires revision based on comments provided by EPA.

_____ This report is approved as the final RFA report.

Note: Upon receipt of this RFA report cover sheet signed by the EPA work assignment manager, the contractor shall forward a copy of this signed cover sheet to the EPA regional project officer and respective EPA RFA tracking contacts -- Dawnee Dahm (RCRA Permits Section) and Cheryl Williams (RCRA Compliance Section).

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1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA), Region 10, under contract number 068-W9-0009, requested that PRC Environmental Management, Inc. (PRC) conduct a Resource Conservation and Recovery Act (RCRA) facility assessment (RFA) at The Boeing Company's Plant 2 (Boeing Plant 2) facility located at 7755 E. Marginal Way South in Seattle, Washington.

The RFA report incorporates information gathered during the preliminary review and visual site inspection (VSI) of Boeing Plant 2, on March 16 and 17, 1992. In addition, information submitted by The Boeing Company in response to EPA's notification letter and information request (Appendix A) is included, where appropriate.

Section 2.0 of the RFA describes the facility and processes, wastes managed, history of contaminant releases, and regulatory history. Section 3.0 describes the environmental setting of Boeing Plant 2. Solid waste management units (SWMUs) are identified and described in detail in Section 4.0. Past and present waste handling practices, waste types, dates of operation, waste types managed, release controls, history of releases, release potential, and recommendations for further investigation are described for each SWMU. Conclusions and recommendations are made in Section 5.0. A list of references appears in Section 6.0. Photographs taken during the VSI appear in Appendix B.

1.1 PURPOSE AND SCOPE OF THE RCRA FACILITY ASSESSMENT

The 1984 Hazardous and Solid Waste Amendments to RCRA authorize EPA to require comprehensive corrective actions for SWMUs and other areas of concern at hazardous waste management facilities, particularly those facilities for which RCRA permit applications are being submitted. These corrective actions are intended to address unregulated releases of hazardous constituents to air, soil, surface water, and groundwater, as well as the generation of subsurface gas.

RCRA corrective actions are implemented in three phases. The first phase is the RFA, which identifies releases or potential releases of hazardous waste or waste containing hazardous constituents that require further investigation. The second phase, the RCRA facility investigation (RFI), is conducted to fully characterize the extent of release of hazardous waste or hazardous constituents. The third phase, the corrective measures study (CMS), determines the need for and extent of remedial measures. This phase includes the selection and implementation of appropriate remedies for all problems identified.

The RFA is a major feature of the EPA corrective action program, and is intended to (EPA 1986):

- Identify and gather information on releases at RCRA-regulated facilities
- Evaluate SWMUs and other areas of concern for releases to all environmental media, and evaluate regulated units for releases to media other than groundwater
- Make preliminary determinations regarding releases of concern and the need for further actions and interim measures at the facility
- Screen from further investigation those SWMUs that do not pose a threat to human health and the environment

The RFA consists of: (1) a preliminary review of information available in agency files, as well as information requested of facility representatives, (2) a VSI to confirm the accuracy of existing information and obtain additional information on past and potential releases from SWMUs, (3) a sampling visit, when warranted, to fill information gaps by obtaining field and analytical data, and (4) preparation of a draft, and later a final, RFA report.

2.0 FACILITY DESCRIPTION

Boeing Plant 2 is one of six facilities owned by The Boeing Company in the state of Washington. Aluminum, steel, and titanium parts are made at this plant for aircraft built at the Boeing-Renton and Boeing-Everett plants in northwestern Washington (Ashley 1989). The plant occupies 107 contiguous acres adjacent to the Duwamish Waterway. The area is nearly flat and is mostly covered with concrete or asphalt pavement, in addition to buildings.

2.1 LOCATION AND OWNERSHIP

Boeing Plant 2 is located at 7755 East Marginal Way South, in Seattle, Washington (Figure 1). The site, located in an industrial area at the southern edge of Seattle, is bounded on the west by the Duwamish Waterway, on the north by Webster Street, on the east by East Marginal Way, and on the south by the Jorgenson Corporation. Corporate headquarters for The Boeing Company are located at the Boeing Plant 2 site.

2.2 FACILITY LAYOUT AND PROCESSES

The Boeing Plant 2 site is occupied by permanent buildings, small structures, and steel storage sheds. The facility layout is shown in Figure 2 (Table 1 is a key to buildings and structures shown in Figure 2). There is a long-range plan for demolition and replacement of buildings at the site over the next 10 years. Reconstruction would begin at the north end of the facility and progress southward. Eight general manufacturing processes are conducted at Boeing Plant 2 in 12 buildings. Each of these processes use chemical products that may contain hazardous constituents and may become wastes. The eight processes are summarized below:

2.2.1 Machining

Airplane parts are currently machined in buildings 2-10, 2-40, 2-41, and 2-44. There are also isolated, small machine shop areas located in some of the other buildings. Airplane parts have been machined at Boeing Plant 2 since 1936. Various coolants, such as Coolube 220, Trim sol, Dimcool Five Star 40, and Blasocut 2000 have been used to cool operating machines.

2.2.2 Cleaning

Parts cleaning has been an ongoing operation at the plant since 1945. Currently, parts are cleaned in buildings 2 -10, 2-40, 2-41, and 2-65. Parts are cleaned in tanks using alkaline cleaners such

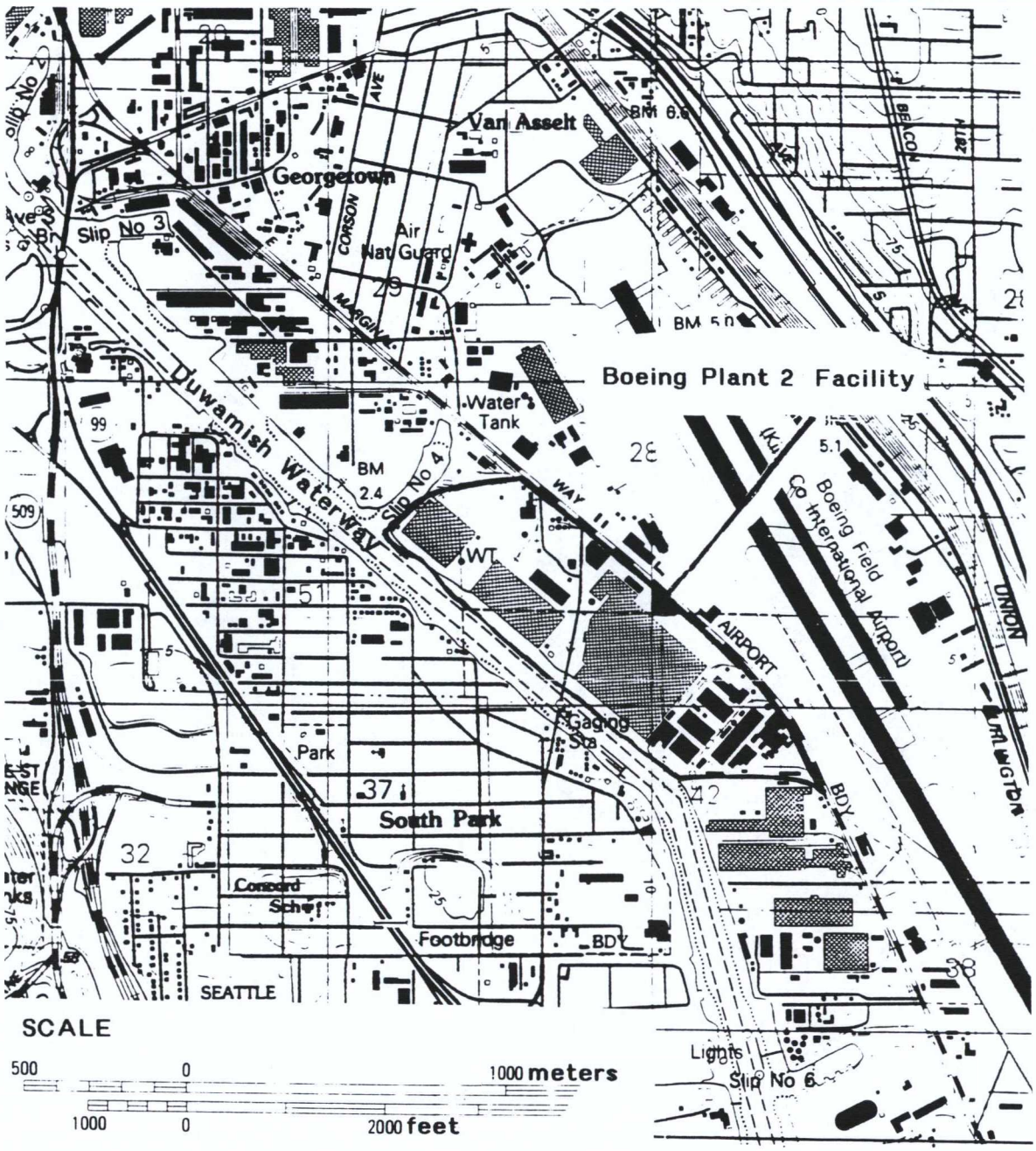

FIGURE 1

Facility Location
Boeing Plant 2
Seattle, Washington

Modified from U.S. Geological Society

PRC Environmental Management, Inc.

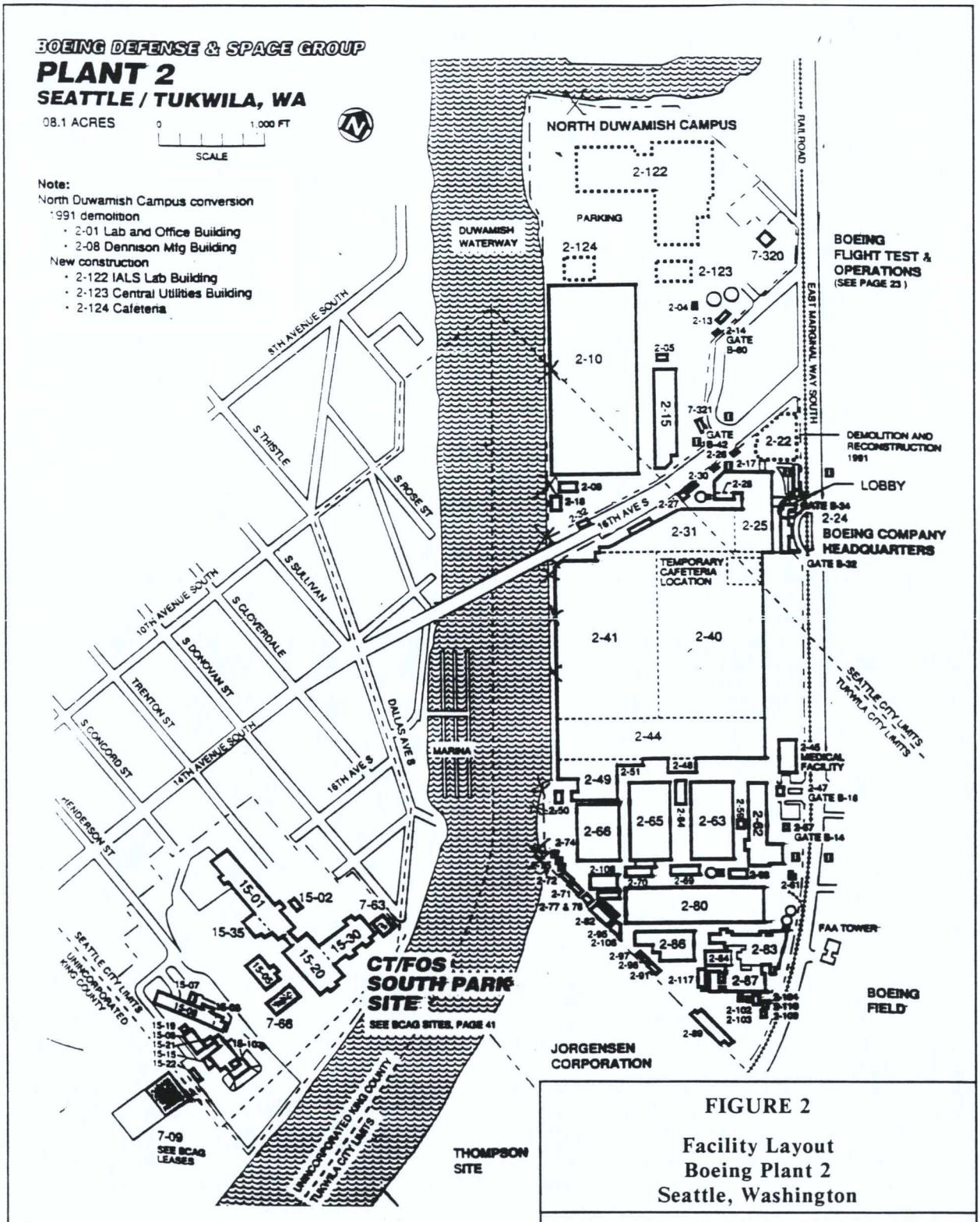

FIGURE 2

Facility Layout
Boeing Plant 2
Seattle, Washington

Source: Johnstone 1992

PRC Environmental Management, Inc.

TABLE 1

DESCRIPTION OF UNITS AT BOEING PLANT 2 FACILITY
Source: Boeing, undated

Building Code	Building Title
2-01	Laboratory and Office Building
	First Floor
	Mezzanine
	Balcony
	Second Floor
2-02	High-Temperature Test Cell
2-03	Chiller House
2-05	Gas Pump Building
2-06	Guard House 2-01 Ramp Gate
2-08	Dennison Manufacturing Building
2-09	Butler Building
2-10	Material and Fabrication Building
	North Half
	South Half
	Balconies
2-11	Water Pump House - North Property
2-12	Acid Storage Building - North Property
2-13	Oil Pump House - North Property
2-14	Guard House Gates B-60 and B-62
2-15	Plant Services Terminal Building
	First Floor
	Balconies
2-16	Guard House Gates B-56 and B-58
2-18	Acid Storage
2-19	Guard House Gate C-16
2-22	Cafeteria Building
2-23	Guard House Gate B-34
2-24	Administration Building
	Basement
	First Floor
	Second Floor
	Third Floor
2-25	Engineering Building
	Basement
	First Floor
	Second Floor
	Third Floor
	Fourth Floor
	Fifth Floor
	Penthouse
2-26	Guard House North Clock
	Aisle Gate B-42
2-27	Emergency Generator Building
2-69	Services Support Building
2-70	Sandblasting Building
2-71	City Light Substation
2-72	Steel Storage Building
2-74	Steel Yard Only
2-75	Trichlorethylene Storage Building
2-78	Cement Storage Building
2-80	Annex D
	First Floor
	Balconies
2-82	Paint Storage Building
2-83	Aerodynamics Building
	Basement
	First Floor
	Second Floor
	Second Floor Mezzanine
2-84	Wind Tunnel Annex
2-86	Foundry Building
2-87	South Service Building
	First Floor
	Balcony
2-89	Salvage Building
2-95	Refrigerated Storage Building
2-96	Radioactive Waste Vault
2-97	Radioactive Waste Vault
2-28	North Boiler House
2-29	North Pump House
2-30	North Electrical Equipment House
2-31	North Warehouse
	First Floor
	Balconies
2-32	Dispatch Station
2-34	Guard House - Boeing Computer Center
2-35	Boeing Computer Center
	First Floor
	Second Floor
	Penthouse
2-40	Final Assembly Building
	First Floor
	Mezzanine
2-41	Primary Building
	First Floor
	First Floor Mezzanine
	Second Floor
	Second Floor Mezzanine
2-43	Tunnels and Underground Areas
2-44	South Warehouse
	First Floor
	Balconies
	Mezzanine
2-48	Factory Material Handling Terminal and Storage
2-49	Jig Erection Building
	First Floor
	Second Floor
2-50	Maintenance Storage
2-51	Box Storage and Shoring
2-52	Beryllium Waste Storage Building - Ref. Only
2-57	Guard House
	South Clock Aisle
2-59	Flammable Storage Building
2-61	South Electrical Equipment Building
2-62	Camouflage Building
2-63	Support Building
	Annex A
	First Floor
	Balcony
2-64	Compressor House
2-65	Annex B
	First Floor
	Balcony
2-66	Annex C
2-68	South Storage and Pump House
2-98	Guard House Gate B-6
2-99	Plant Services Maintenance Building
2-102	Dunnage Storage Building
2-103	Bottled Gas and Acid Storage
2-104	Hazardous Waste Storage
2-106	Oil Storage Building
2-108	Plant Services Paint Building
	First Floor
	Second Floor
2-109	Hypersonic Wind Tunnel
2-110	Compressor Building
2-112	Guardhouse Gate B-32
2-114	Guardhouse Gate B-18
2-115	Material Handling Dispatch
2-116	Wind Tunnel
	First Floor
	Second Floor
2-117	Compressor House
	First Floor
	Second Floor
2-118	Car Unloading Facility - Ref. Only
2-282	Production Sandblasting Building

as ammonium hydroxide, sodium hydroxide, and potassium permanganate; products containing sodium metasilicate, sodium phosphate, and tribasic are also used for cleaning.

2.2.3 Chemical Mill Etching

Chemical mill etching removes aluminum from aircraft parts to make planes lighter. This process has been done at Boeing Plant 2 since 1960. Currently, chemical mill etching is done in buildings 2-10 and 2-31. Adcoat 828, which protects selected portions of the parts from chemical milling, is applied to the aluminum piece and cured. It is then carved and removed from portions of the piece that need to be milled down. The parts are dipped in Aluminum Chem Mill solution, which removes up to 0.1 inch of aluminum.

2.2.4 Electroplating

Airplane parts have been electroplated at Boeing Plant 2 since 1941. Electroplating processes were temporarily halted in February 1992 because of production changes, but are scheduled to resume in building 2-31 in mid-summer 1992. Eventually, the electroplating circuit in building 2-31 will be relocated to the Boeing-Kent facility (Whitson 1992).

Parts are electroplated to apply coatings of zinc, copper, cadmium, aluminum, or silver, or to remove accumulations of unwanted residue. Significant compounds used in the plating baths include sodium and potassium cyanide, cadmium oxide, caustic soda, sodium and potassium carbonate, silver cyanide, silver metal, sodium hydroxide, cadmium balls, nickel sulfate, cadmium oxide, copper cyanide, zinc cyanide, and miscellaneous products such as Duozinc 101, ROHC Super XL Brightner, Rochelle Salts, En Strip, and Endox 214.

2.2.5 Chemical Conversion Coating

Chemical conversion coating processes have been ongoing at Boeing Plant 2 since 1950. These processes provide a protective coating and remove unwanted residue from parts. Parts are immersed in large tanks holding concentrated chromic acid and other acids such as hydrofluoric acid, hydrochloric acid, sulfuric acid, and nitric acid. The parts are rinsed with deionized water after they are removed from the acid tanks. Chemical conversion coating is currently carried out in buildings 2-10 and 2-62.

2.2.6 Toolmaking

Toolmaking has been ongoing since 1936 at Boeing Plant 2, and currently takes place in buildings 2-40, 2-49, 2-83, and 2-86. Various coolants and lubricating oils are used to maintain the machines that make the tools.

2.2.7 Painting and Paint Stripping

Painting and paint stripping have been done since 1956 at Boeing Plant 2. Painting is currently done in buildings 2-10, 2-31, 2-62, and 2-108. Paint is sprayed in wet booths and areas equipped with screens. Paint is stripped in building 2-10.

2.2.8 Silver Reclamation

Silver residue in photographic fixers has been reclaimed at Boeing Plant 2 since 1982 in building 2-89.

2.3 WASTES MANAGED

The 1990 annual dangerous waste report submitted to the Washington Department of Ecology (Ecology) states that 80,842 tons of hazardous wastes were stored at Boeing Plant 2 in containers and in aboveground and underground tanks. Hazardous wastes and wastes containing hazardous constituents are generated at the various manufacturing process areas described in Section 2.2 (see Table 2).

In addition, there are ancillary maintenance-related and research-related processes that contribute nominally to waste streams at Boeing Plant 2.

2.3.1 Current Waste Practices

Wastes are currently collected and stored at designated satellite, accumulation, and central staging areas and in bulk waste storage tanks located inside and outside of buildings. Wastes are shipped off site for disposal or recycling. No hazardous wastes are disposed of on site. Most machine coolant is processed and recycled on site. A small amount of methyl ethyl ketone is processed in an on-site still and recycled.

TABLE 2

HAZARDOUS WASTES GENERATED AT BOEING PLANT 2

Description	Characteristics	Generation Process	Waste Code RCRA	Waste Code Ecology
Chrome-contaminated water	Liquid; strongly acidic; metal contaminants (chromium, zinc, lead, copper, nickel, cadmium)	Anodic and alodine lines (process baths); draws, tank dumps; dragouts; chrome regenerant circuit	D002, D006 D007, D008	--
Mixed acid waste	Liquid; strongly acidic; hydrochloric, sulfuric, nitric, hydrofluoric, and chromic acids, plus metal contaminants (aluminum, copper, chromium)	Process baths; dumps, drains, dragouts	D002, D007	WT02
Solvent and paint	Liquid; methyl ethyl ketone, acetone, toluene; oil-base and two-part paints and primers	Paint booths; "dirty" solvents, out-of-specifications paints; consolidated	D007, D008 F005	--
Aluminum chem mill	Sludge; sodium hydroxide, aluminum, triethanolamine, sodium sulfide	Aluminum parts etching	D002, D003	
Coolant	Liquid; organic ethanolamines, polyalkene glycol, oxygenated organic acids, water, preservatives, petroleum oil, petroleum sulfonate, chlorinated alkene polymer, nonionic surfactant, organic alcohol, polypropylene glycol, substite indol, silicone deframer	Machining and toolmaking	--	WT02,

TABLE 2

HAZARDOUS WASTES GENERATED AT BOEING PLANT 2

Description	Characteristics	Generation Process	Waste Code RCRA	Waste Code Ecology
Cans	Solid; "empty" metal and plastic containers containing paints, primers, epoxy, bondoresin hardeners, solvents, and industrial lubricants	Used containers with residual amounts of hazardous material	D001, D002 D007, D008	WT02
Empty drums	Solid; residual amounts of hazardous waste in fiber and steel drums	Various plant processes	D001, D002 F001, F007	WT01
Paint booth sludge	Liquid and sludge; water and solidified paints and primers (primarily two-part epoxies and oil base)	Paint overspray collected in wet-booth reservoirs	D007	WT02
Solvent-contaminated rags	Solid; rags, Q-tips, paper towels, and cheesecloth contaminated with paint, primer, epoxy, resin, skydrol, MEK, acetone, toluene, and other solvents	Cleaning and painting equipment and parts	D001	WT02
Cyanide	Liquid; copper cyanide, sodium cyanide	Process baths, draws, and dumps	D002, D006 D007, D003 F007	WT01
Paint screens	Solid; metal screens coated with paint containing chrome	Overspray accumulation in screens	D007, D008	WT02

TABLE 2

HAZARDOUS WASTES GENERATED AT BOEING PLANT 2

Description	Characteristics	Generation Process	Waste Code RCRA	Waste Code Ecology
Alkaline	Liquid; sodium hydroxide, aluminum hydroxide, sodium metasilicate and sodium phosphate, plus metal contaminant (chrome)	Dumps, draws, and dragout of parts from process tanks	D002	WT02
Skydrol	Liquid; tributyl phosphate, dibutyl phenyl phosphate, 2,6-D-tert-butyl-p-cresol	Used hydraulic oil for airplanes	D002	WT02
Lab Paks	Solid, liquid, gas; flammable, combustible, chrome/corrosive, poison B, corrosive acid, corrosive alkaline, oxidizer, mercury, asbestos	Laboratory procedures	D001, D002 D007, D009	WT02
Oil	Solid and liquid; oil filters, oil, absorbent pads	Automotive maintenance procedures	D002, D011 D006	WT02
Fixer	Liquid; residual amounts of silver	Film development	D011	--

Currently, 14 satellite and 65 accumulation areas are designated to receive wastes from various process areas. Plate 1 identifies past and present container management areas, including container accumulation areas and satellite areas. The locations of the accumulation and satellite areas may change over time. The types of wastes handled at these areas include trichloroethylene sludge, oil filters, paint and paint screens, solvents, pads and rags, empty cans, antifreeze, paint stripper, silicone, rubber, coolant, resins, metal sludge, and oily water. Satellite areas are located near areas where wastes are initially generated, such as paint booths or parts machines. Hazardous wastes are deposited at each satellite area in steel drums up to 55 gallons in size. Solid hazardous wastes are placed into steel drums fitted with plastic removable liners and a steel lid with a hinge attached to the lid of the drum. Liquid wastes are poured into closed drums with a funnel. Drums that hold liquid wastes are stored over a secondary containment pan.

At accumulation areas, 55 gallons or more of hazardous waste are stored in steel drums for up to 60 days before being moved to the central staging areas. Similar drums are used at the accumulation areas as are used at satellite areas. Currently, there are two central staging areas at Boeing Plant 2. The first central staging area, building 2-104, is located at the southern end of the site; wastes to be stored for more than 90 days are kept here. The second central staging area, building 2-120, is located at the northern end of the property. Wastes to be stored for less that 90 days are stored in this building. Wastes held in the central staging areas are shipped off site to a licensed treatment, storage, and disposal (TSD) facility for disposal or recycling (Johnstone 1992).

In addition to the central staging areas, 10 bulk waste storage tanks are used for holding wastes. Capacities of these tanks range 375 gallons to 5,000 gallons. Waste acids, cyanides, rinse waters, paint sludges, oil, mild caustics, and oily water and coolant wastes are temporarily stored in the bulk storage tanks, four of which are regulated under interim status (Section 2.5). Wastes are pumped directly from the tanks into tanker trucks that haul the wastes to off-site licensed TSD facilities for disposal or recycling.

Boeing Plant 2 also handles wastes and materials generated at other Boeing facilities. These wastes are received at the reclamation yard, and include scrap metal, empty drums, and metal shavings containing liquids, such as coolant, trichloroethylene, and methyl ethyl ketone. Wastes from other Boeing facilities are shipped off site for disposal or reclamation.

2.3.2 Past Practices

The Boeing Company reports that between 1936 to 1977 the following wastes were generated at Plant 2 (Johnstone 1992):

- Solid nonhazardous waste
- Mild caustic
- Cyanide
- Process rinse water
- Oil and oily water
- Chromated acid and caustic
- Alkaline
- Paint and solvent
- Solid hazardous wastes

Historic disposal practices are described below and in the following chart.

Solid, nonhazardous, and mild caustic wastes were disposed of in local landfills from 1940 through 1964. During the same period, cyanide wastes were barreled and ocean dumped (more than 100 miles offshore). After 1964, cyanide and caustic wastes were transported to Western Processing in Kent, Washington. Process rinse waters were discharged into the Duwamish River from 1936 through 1959 after being "neutralized and diluted." After 1959, rinse waters were pretreated and discharged to Metro treatment facilities (which is the current practice). Oils and oily water were put in barrels and disposed of in local landfills between 1940 through 1954. From 1954 through 1977 these wastes were transported, first to Queen City Farms, King County, Washington, and later to Western Processing. Acid and caustic chromated wastes were disposed of in cisterns located on site near the Duwamish Waterway from 1945 through 1954. Beginning in 1953 and lasting until 1957, these wastes were transported by barge to the Strait of Juan de Fuca and trickled into the open water. Afterwards, through 1977, these wastes were transported to Queen City Farms and Western Processing for disposal. Alkaline wastes were transported to either Queen City Farms (1957 through 1968) or to Western Processing (1964 through 1977). Before 1957, these wastes were disposed of on site in cisterns. Paints and paint solvents were disposed of in on-site cisterns from 1945 through 1954. Later, they were transported to Queen City Farms (1957 through 1968), Western Processing (1964 through 1977), and Preservative Paints (1955 through 1977). Solid hazardous wastes were transported to Queen City Farms (1957 through 1968) and Western Processing (1964 through 1977). Disposal of these wastes before 1957 is not recorded.

Type of Waste	Disposal Site	Date
Solid Nonhazardous Mild caustic	Local Landfills	1940-1964
Cyanide	Ocean (>100 miles offshore)	1940-1964
Caustic	Western Processing	after 1964
Rinse waters	Duwamish River	1936-1959
	Metro sewer	after 1959
Oils, oily water	Local landfills	1940-1954
	Queen City Farms	1954-1977
	Western Processing	after 1977
Chromated acid, Caustic	On-site cisterns	1945-1953
	Strait of Juan de Fuca	1953-1957
	Queen City Farms/Western Processing	1957-1977
Alkaline	On-site cisterns	Before 1957
	Queen City Farms	1957-1968
	Western Processing	1964-1977
Paint, paint solvents	On-site cisterns	1945-1954
	Queen City Farms	1957-1968
	Western Processing	1964-1977
	Preservative Paints	1955-1977
Solid hazardous	Queen City Farms	1957-1968
	Western Processing	1964-1977

2.4 HISTORY OF RELEASES

Table 3 lists documented releases to the environment of hazardous wastes and wastes containing hazardous constituents from Boeing Plant 2.

HAZMAT incident files from July 1966 through February 1992 were reviewed to identify the number of spills at Boeing Plant 2 that released to the environment. A release to the environment was verified only if the report indicated that the spill escaped from the plant into the Duwamish Waterway or to the river bank, soil, groundwater, air, or to the Metro storm drain or sanitary sewer. Where the HAZMAT incident files were sufficiently specific about the specific location of the spill (that is the specific SWMU), the incident is described under History of Releasers for the specific SWMU in Section 4.0.

HAZMAT incident files list many more spills at the plant than those shown in Table 3. These other spills occurred at process areas within buildings and were contained in sumps or by emergency spill control equipment, and are not considered to be releases to the environment. Spill response procedures specified in the contingency plan and emergency response plan were followed by Boeing Plant 2 personnel in these cases.

2.5 REGULATORY HISTORY

In 1980, Boeing notified Ecology of hazardous waste activity at Boeing Plant 2 and submitted a Part A hazardous waste permit application to EPA. On October 22, 1981, EPA issued a determination to The Boeing Company in regard to Plant 2 that as owner and operator of a hazardous waste management facility it had met the requirements of Section 3005(e) of RCRA for interim status. On June 30, 1984, Boeing was issued a dangerous waste permit by Ecology authorizing operation of a hazardous waste storage facility at Boeing Plant 2. In 1988, facility personnel submitted a Part B hazardous waste permit application to EPA.

The Boeing Company has discharged noncontact cooling water into the Duwamish Waterway since 1975 under provisions of a National Pollutant Discharge Elimination System (NPDES) permit. It also holds a Metro permit for discharge of storm water and sanitary wastes to the sewage treatment plant.

Storage areas that are regulated under interim status at Boeing Plant 2 (Ecology 1990) include:

1) Building 2-104, recyclable solvent storage
2) Building 2-91, oily waste and coolant storage tank
3) Building 2-31
    - acid hold tank
    - cyanide hold tank
4) Building 2-09, chromic acid hold tank
5) Building 2-01, landing gear cleaning sump

Building 2-91 and Building 2-31 (the cyanide hold tanks) are deactivated. Building 2-01 has been demolished and the landing gear cleaning sump removed. The Boeing Company submitted closure activity reports to Ecology in 1991.

TABLE 3

HISTORY OF RELEASES AT BOEING PLANT 2

(Source: Boeing Plant 2 HAZMAT incident files and other sources as specified in footnote)

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
7/27/66[a]	Bldg. 2-31	Metro sewer	Chrome/nitric acid	1,500 pounds	Circulating pipe ruptured, discharging process tank contents to Metro sump.
7/19/67[a]	Bldg. 2-41	Metro sewer	Chromic acid	25 pounds	Tank overflowed to Metro sump.
4/16/68	Bldg. 2-10	Metro sewer	Chromic acid	Not known	Tank overflowed to Metro sump.
1/16/69	Bldg. 2-10	Metro sewer	Chromic acid	Not known	Tank overflowed to collection sump - leaked into Metro sump.
1/19/69	Bldg. 2-41	Metro sewer	Chromic acid	Not known	Steam coil leak.
8/3/72	Bldg. 2-41	Storm sewer	Trichloroethylene	Not known	Part fell into degreaser tank, punching hole in the tank.
1/30/73	South of Bldg. 2-10	Storm sewer	Chromic acid	Not known	Surplus process tank was stored outside. Rainwater washed residue to storm sewers.
10/19/73	Bldg. 2-10	Metro sewer	Chrome/sulfuric acid	Not known	Process tank overflowed to Metro sump.
6/18/80	Bldg. 2-31,Roland plating line	Sanitary sewer	Chromic acid	58 pounds	Process tank overflow.
12/16/80	Bldg. 2-10, Anodic line	Sanitary sewer	Chromic acid	97 pounds	Steam coil leak.
9/21/82	Not specified	Duwamish Waterway	Lithium bromide salt solution	450 gallons	--

TABLE 3 (continued)

HISTORY OF RELEASES AT BOEING PLANT 2 (Continued)

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
12/15/82	Battery shop	Metro sewer	Acid	Not specified	Line left open to tank; tank overflowed.
1/3/83[a]	South of Bldg. 2-10	Duwamish Waterway	Alkaline cleaner	Not reported	Waste acid being pumped to mobile tanker; drain was open.
4/7/83	Not specified	Metro sewer	Organic developer and stripper (11% solution of 2 butoxy ethanol and 33% solution of methanol amine)	1 gallon	--
3/11/83	Not specified	Metro sewer	Surfactant	400 gallons	Detergent solution - no metals.
9/22/83a	South of Bldg. 2-01	Storm sewer	Lithium bromide	1,000 pounds	Refrigerant leak from water chiller undergoing repairs.
3/10/84	Process area, not described	Metro sewer	Hydrochloric acid solution used for descaling condenser	100 gallons	Flushed with 100 gallons of water.
3/23/84[b]	Process area, not specified	Soil Duwamish Waterway	Emulsified oil	Not known	Leaking machine caused spill.
3/23/84	Bldg. 2-41	Soil groundwater	Coolant and oil	350 gallons	Evidence of leakage through foundation.
4/27/84[a]	Bldg. 2-41	Soil	Oil/phenol coolant solution	Not known	Spent coolants leaked to soil through crack in collection sump. Groundwater - 3 ppm oil, 13 ppb phenol, COD 328 mg/L.

TABLE 3 (continued)

HISTORY OF RELEASES AT BOEING PLANT 2 (Continued)

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
6/20/84	Bldg. 2-01	Duwamish Waterway	Ethylene glycol (antifreeze)	100 gallons	Forklift truck hit a pipe with antifreeze used to de-ice bridge.
7/2/84	Not specified	Metro sewer	Coolant	10 - 20 gallons	7,000 ppm oil.
7/13/84[a]	Bldg. 2-31	Metro sewer	Ethylene glycol (antifreeze)	230 pounds	Broken pump casing on chilled water system
7/30/84[a]	Bldg. 2-41	Duwamish Waterway	Chrome, copper, zinc	Not known	Process tank located under building overturned during removal of tank, spilling residue to water.
11/8/84[a]	Bldg. 2-70	Duwamish Water	Oil-water mixture	5 gallons	Steam clean receiving sump overflow.
11/13/84[a]	Bldg. 2-41	Metro sewer	Chrome, copper, lead, cadmium, zinc	177 pounds	Fume-scrubber water backflowed to ductwork discharging to sewer.
2/1/85[a]	Bldg. 2-66	Atmosphere	Trichloroethylene	30 pounds	Small vapor degreaser (50 gallon) exothermic reaction.
2/6/85[a]	Salvage yard	Storm sewer	Mineral oil	15 - 30 gallons	Electric switch leaked in salvage yard; oil trapped in retention catch basin and cleaned up.
6/7/85	Bldg. 2-41	Duwamish Waterway bank	Lead, zinc solder	30 pounds	Break in mold allowed solder to flow to floor drain.
6/7/85	Not specified	Duwamish Waterway	Solder	Not reported	--
7/31/85[c]	Northwest corner of Bldg. 2-41	Soil	Trichloroethylene	1,200 pounds	Construction crew punctured distribution pipe while trying to install electric conduit. Action was taken immediately to remove the soil. Clay layer prevented deeper penetration.
2/3/86	Bldg. 2-41	Soil	Wastewater from silk screen operation	850 pounds per day	Sump found leaking; contained low levels of heavy metals.

TABLE 3 (continued)

HISTORY OF RELEASES AT BOEING PLANT 2 (Continued)

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
2/5/86	Bldg. 2-15	Soil	Hydraulic oil from underfloor hoist	21 pounds per day	Approximately 20 gallons per week had to be added to make up for oil losses.
5/5/86[d]	North end of Bldg. 2-15	Groundwater	Gasoline	Not known	--
7/29/86	Bldg. 2-15	Metro storm sewer	Water/ink mixture	20 pounds	--
4/2/87[e]	Process area not specified	Metro sewer	Water with 0.225 ppm isopropyl alcohol	About 120 gallons per day for an unknown number of days	This was added because of a waste paper watering - down process.
10/17/87	Bldg. 2-31	Metro sewer	Turco 2623 (Coolant)	200 gallons	--
1/18/88[i]	Southeast corner of Bldg. 2-15	Soil	Bunker C fuel oil	About 50 gallons	Fuel spilled on pavement during transfer operations; contained with speedi-dry. Dike built to protect nearby storm drain. Some fuel reached storm sewers because of heavy rain. Spill cleaned up.
2/1/88	Bldg. 2-10	Duwamish Waterway or Metro storm sewer	Dye penetrant solution/mineral oil and florescence dye	100 - 200 gallons into river; 1,300 gallons into Metro sewer	Sprinkler head failed, washing approximately 200 gallons of water and contaminant to river, 1,500 gallons to Metro sewer.
2/10/88[f]	Process area not specified	Duwamish Waterway	Chromium	Not known	Grab sample identified chromium.
4/88[h]	Southwest corner of Bldg. 2-10	Ground	Chromium	Not known	Investigation of leaking second containment plastic liner. Chromium concentration found to be low. Also, isolated from groundwater intrusion and infiltration by precipitation since it spilled onto concrete floor.

TABLE 3 (continued)

HISTORY OF RELEASES AT BOEING PLANT 2 (Continued)

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
8/4/88[g]	Bldg. 2-41	Ground	Nitric-hydrofluoric acid bath	62 gallons of nitric acid, 7 gallons hydrofluoric acid mixed with potable water	Acid spilled to sump below. Many employees given medical treatment. Sump contents 28,000 gallons sent for disposal.
8/19/88	Bldg. 2-64	Storm sewer	Turbine oil	5 gallons	Portable pump tank overflowed into storm sewer. Spill cleaned up.
8/31/88	Bldg. 2-01	Storm drains in parking lot	Dearicide 706	5 gallons	Biocide foamed when added to biotower. Foam washed to storm sewer. Catch basin and storm sewer were cleaned.
12/17/88	Bldg. 2-88	Sanitary sewer	Hydrochloric acid	10 gallons	Spilled during boiler cleaning. Spill neutralized and flushed into sanitary sewer.
3/1/89	Bldg. 2-83	Storm sewer	Coolant oil	2 gallons	Coolant in metal chips leached from bottom of storage tub onto ground.
3/12/89	Bldg. 2-68	Storm sewer	Paint residues	1 quart	Open-topped paint container overflowed from excess rainwater.
3/24/89	Bldg. 2-10	Ground	Latex paint primer	25 gallons	Buckets in dumpster leaked onto ground. Leak cleaned up.
3/31/89[k]	Process Tank #17 in Bldg. 2-41	Air	Nitrous gases	Not known	Reaction occurred when titanium alloy was placed in tank containing mixture of nitric acid and hydrofluoric acid. This caused an oxide release to the atmosphere; however, vapors went through a scrubber and exhaust systems. Levels were low enough to create no hazard at the site.
4/23/89[m]	Bldg. 2-41	Ground	Sodium cyanide, hydrogen cyanide	750 gallons with less than 1 ounce per gallon sodium cyanide	Copper plating process tank containing sodium cyanide solution overflowed into cyanide sump with some leakage to adjacent acid sump. Threat of hydrogen cyanide gas release when cyanide leaked into an acid sump; 3,125 gallons contaminated with cyanide were sent to Chempro, including spillage to both tanks and water to flush out residual cyanide from acid sump.

TABLE 3 (continued)

HISTORY OF RELEASES AT BOEING PLANT 2

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
5/26/89[j]	Process area not specified	Air	Nitric acid	Not known	Liner in nitric acid process tank developed a leak. Acid dripped onto a steam pipe and reacted with the steel pipe, which resulted in a steam leak. Assessment was that this was not a major problem.
8/16/89[l]	Bldg. 2-01	Air	Ammonia vapors	Not known	Unplanned release of ammonia vapors caused by an accidental release of a valve on the manifold system that supplies ammonia to reproduction systems. One employee received medical treatment.
8/29/89	Bldg. 2-66	Storm drain	Grinding sludge	2 gallons	Storm drain was pumped and cleaned out.
2/22/90	Bldg. 2-15	Duwamish Waterway	Bunker C oil	55 gallons	Spilled oil was contained with booms and absorbent pads. Some released to river.
6/4/90	Bldg. 2-10	Soil	Condensate	Unknown	Condensate sump bottom showed evidence of deterioration. Bottom was removed and sump reconstructed.
8/31/90	Bldg. 2-31	Air	Nitric acid	55 gallons	Acid pumped into metal grating and piping rather than acid hold tank. Nitrous acid gases formed.
10/1/90	Bldg. 2-31	Metro sewer	H_2SO_4	300 gallons	Hose between H_2SO_4 anodine tank and heat exchanger disconnected; heat exchanger was removed.
10/2/90	Bldg. 2-31	Metro sewer	H_2SO_4	300 gallons	Most material contained in sump. Some escaped to Metro sewer.
10/5/90	Bldg. 2-31	Metro sewer	Sulfuric acid	300 gallons	Faulty hose connection to a circulation pump caused release of H_2SO_4 to Metro storm drain.
10/9/90	Bldg. 2-70	Duwamish Waterway	Sandblast scrubber water	200 gallons	Most of scrubber water was contained in catch basin and recovered.

TABLE 3 (continued)

HISTORY OF RELEASES AT BOEING PLANT 2

Date	Location	Receiving Environment	Material Spilled	Amount Spilled	Comments
8/26/91	Bldg. 2-89	Soil	Unknown coolant	3 gallons	White liquid identified on surface; clear liquid in reclamation yard.
10/3/91	Bldg. 2-89	Outside pavement	Waste oil	5 gallons	Spill contained and cleaned up.
10/30/91	Bldg. 2-64	Storm sewer	Cooling water	50 gallons	Magnetic cover placed over catch basin to cut off flow.
10/30/91	Bldg. 2-64	Storm sewer, Duwamish Waterway	Deardon 706 (biocide)	55 gallons	None recovered. Cooling tower containing 5 ppm Deardon overflowed releasing about 55 gallons of water/Deardon solution.
1/15/92	Bldg. 2-10	Duwamish Waterway bank	Hydraulic oil	Unknown (but small amount)	Material discharged through a 2-inch-diameter hole in floor of building.

Notes:

[a] Bowden 1985
[b] Ecology 1985
[c] Schultz 1985
[d] Healy 1986
[e] Devitt 1987
[f] Lampe 1988
[g] Johnson 1988a
[h] Landau 1988
[i] Johnson 1988b
[j] Schultz 1989a
[k] Schultz 1989b
[l] Archer 1989
[m] Schultz 1989c

Metro = Municipality of Metropolitan Seattle

COD = chemical oxygen demand

3.0 ENVIRONMENTAL SETTING

Boeing Plant 2 is located in an industrial area of the Duwamish Waterway south of Harbor Island. The following sections describe the general environmental setting of Boeing Plant 2.

3.1 TOPOGRAPHY AND SURROUNDING LAND USE

Boeing Plant 2 is located on the Duwamish Waterway about 2.5 miles upstream of the river mouth. The original topography of the lower Duwamish River valley, including the Boeing Plant 2 site, has been extensively modified since 1918 when the Duwamish River was channeled to create the Duwamish Waterway. The surrounding valley and lowlands were filled and graded over the next few decades, creating relatively flat topography at Boeing Plant 2. The elevation of the south yard is approximately 19 feet above the mean lower low water level (Landau 1986). The area is heavily industrial; four parks, three schools, and the Boeing airfield are all within 1 mile of the site (Ecology 1985).

3.2 METEOROLOGY

The site is located within the mild maritime climate of the Puget Sound lowlands. Data collected by the National Weather Service at Seattle-Tacoma International Airport (NWS 1990) show that the average annual temperature is 51.4°F. The coldest month is January (average temperature 39.1°F); the warmest month is July (average temperature 64.8°F). Annual precipitation is 38.6 inches per year. The Seattle-Tacoma International Airport is located approximately 5 miles south of Boeing Plant 2.

3.3 SURFACE WATER

The Duwamish River begins at the confluence of the Black River and Green River. Twelve miles downstream, the Duwamish River enters Elliott Bay at the northern end of Harbor Island. The Duwamish River drainage area is approximately 440 square miles. Peak flows typically do not exceed 12,100 cubic feet per second. The Duwamish Waterway generally exhibits a saltwater wedge stratification, which is characterized by two-layer flow. The bottom saltwater wedge has a net landward flow. The salt layer comes from Elliott Bay. The quantity and distribution of saltwater that extends into the Duwamish Waterway is a function of river discharge and tidal pumping. The mean landward flow has been reported at mile 1.2 to be roughly 187 cubic feet per second. Saltwater intrusion has been observed as far as mile 10 during extreme high tides and low river flow. (Harper-Owes 1983)

Noncontact cooling water is discharged from Boeing Plant 2 to the Duwamish Waterway through 26 outfalls per the NPDES permit.

3.4 SOIL AND HYDROGEOLOGIC CONDITIONS

The soil and groundwater conditions at Boeing Pant 2 are described in nine reports on subsurface and remediation projects. These reports describe Boeing Plant 2 as located in an area where the existing ground surface has been formed by the placement of extensive fill, primarily hydraulic fill from the channelization of the Duwamish River bed during construction of the Duwamish Waterway. The native soil, which consists mainly of sand and silty sand, is buried approximately 8 feet beneath the hydraulic fill (Landau 1986).

A complex mixture of interbedded sands and silts extends to depths of 60 to 80 feet below ground surface. Fine-grained estuarine deposits that contain shell fragments and other organic material underlie this fill and alluvium. Subsurface investigations show the upper fill and alluvial deposits to be composed of the following four major zones:

- Sand and silty sands (fill)
- Organic silts and clays (original bay muds)
- Interbedded sands and silts (alluvium)
- Clean black sands (alluvium)

Groundwater flow direction and gradient may vary because of tidal fluctuations within the nearby Duwamish Waterway and seasonal fluctuations of the groundwater table. The groundwater level ranges from 7 to 13 feet below ground surface. The overall direction of groundwater flow is westward toward the waterway with a slight northward component (Landau 1986). Groundwater levels in the area of Boeing Plant 2 may fluctuate 1 to 2 feet in response to tidal variations in the Duwamish Waterway. Groundwater gradient most likely ranges from about 0.002 to 0.004. The reports available for review did not describe the hydrologic relationship between on-site groundwater and the Duwamish Waterway. Groundwater is not used for drinking within 3 miles of the site (Ecology 1985).

3.5 RECEPTORS

Receptors of potential releases of hazardous constituents into the environment from Boeing Plant 2 include plants and animals that inhabit the Duwamish Waterway and consumers of potentially contaminated game species taken from the Duwamish Waterway. The general population is not a likely receptor because groundwater near the plant area is not used for

drinking water or other domestic purposes; soils at the plant site are covered with concrete, asphalt, and buildings; and site access is controlled, preventing entrance by the general public. Potential release pathways include stormwater runoff and groundwater discharge into the Duwamish Waterway, in addition to direct discharge. Contaminants in air are confined to the work areas inside buildings. Workers may be exposed to hazardous wastes in air and through direct contact.

4.0 DESCRIPTION OF SOLID WASTE MANAGEMENT UNITS

Seventy-nine SWMUs were identified at Boeing Plant 2. Each unit is identified by a specific number series that also identifies its building association, where applicable. For example, SWMU 2-41.30 indicates that SWMU 30 is associated with building 2-41. Each SWMU is also described by name. Satellite and accumulation areas within specific buildings are grouped as single SWMUs. Past and present satellite and accumulation areas are shown in Plate 1. Machine pits within specific buildings and oil/water separators are grouped as single SWMUs. Individual machine pits are shown in Plate 3. The oil/water separators (SWMU 78) and cisterns (SWMU 79) are not shown on the plates. Plates 1, 2, and 3 were prepared by the Boeing Facilities Department, and do not correspond in all cases to the SWMUs identified in this report. Plates 1, 2, and 3 illustrate the location of process areas and hazardous waste storage areas at Boeing Plant 2 which are discussed in the following sections. Photographs of SWMUs appear in Appendix B.

Any discernable unit at which solid wastes have been placed at any time, regardless of whether the unit was intended for the management of solid or hazardous waste, is identified as a SWMU and is described in the following subsections. Both past and present waste management practices are considered in designating SWMUs.

4.1 SWMU 2-01.1: LANDING GEAR CLEANING SUMP

Airplane landing gear was cleaned in building 2-01 at the northern end of Boeing Plant 2. A 1,000-gallon-capacity landing gear cleaning sump was constructed of reinforced concrete to contain wastes generated during repair and cleaning of landing gear assemblies from large jet aircraft. The landing gear cleaning sump was designated by The Boeing Company as Staging Area 5 in the part B permit application (Boeing 1985). Building 2-01, which was built in 1954, was demolished in 1991. Closure of the sump began in March 1991 and was completed in September 1991. A subsurface environmental assessment at building 2-01 was conducted by Roy F. Weston, Inc. (Weston 1990) before closure activities were initiated. Subsurface conditions were evaluated using geophysical surveys, analysis of boring samples, and analysis of groundwater samples collected from the borings. Trichloroethene (TCE), 1,1,1-Trichloroethane, chrysene, methyl ethyl ketone (MEK), acetone pyrene, Di-n-octylphthalate, and total petroleum hydrocarbons were detected in soil samples collected from four boreholes at the north end of the building near the sump. Vinyl chloride and chromium were detected in groundwater samples obtained from three of the boreholes.

Closure activities included decontamination, removal of the sump, and excavation of soil. An engineer's certification for closure, certifying that closure activities complied with the closure plan was submitted by CH2M Hill to The Boeing Company on December 13, 1991. However, no letter was found in Ecology's files approving the closure activities. Currently, landing gear is cleaned in building 2-40.

Dates of Operation

Use of the sump began in April 1980. The sump was decommissioned and remaining material was pumped out in October 1990. This unit was regulated under interim status.

Wastes Managed

Wastes stored in the sump consisted of mixtures of water, oils, and nonhalogenated solvents. Materials used in the cleaning and degrease area that contributed to the waste collected in the sump included: Chevron 325 (Stoddard solvent), Mil H-5606 (oil), Skydrol (phosphate esters), acetone, TCE, MEK, and toluene mixture (nonhalogenated solvents), Lubrizol 1395 (oil), and aero shell 5, 16, and 22 (greases). An average of 600 gallons of wastes in the sump were picked up one to three times yearly by a licensed hazardous waste handler. The maximum volume of wastes stored was 950 gallons.

Release Controls

The sump was equipped with a float-operated high-level alarm that alerted operating personnel when the sump was full. The alarm and operating conditions were inspected every 30 days. The sump was inspected annually for evidence of leakage.

History of Releases

No releases to the environment were recorded in the HAZMAT spill incident files reviewed. However, the kind of constituents identified in soils and groundwater samples collected near the sump indicate that the sump leaked and released wastes to soils and groundwater (Weston 1991).

Conclusions Regarding Release Potential

Soils and concrete were tested during and following closure of the sump (CH2M Hill 1991). The

sample analysis program showed that all closure performance standards for organic constituents in soil were achieved after removing the concrete sump and underlying soils.

Recommendations for Further Investigation

No further investigation of soils is recommended. The closure performance standards established for soils appear to have been achieved. However, additional groundwater samples should be obtained to determine the nature and extent of contamination from chromium. Chromium in groundwater may be from another source. It is uncertain if chromium was a normal constituent of wastes stored in the sump.

4.2 SWMU 2-09.2: CHROME WASTE TANKS (Photo 1)

Building 2-09 contains two 4,000-gallon tanks made of chromic acid-resistant fiberglass approximately 3/16-inch thick. One tank is used to hold chrome-bearing rinse waters from the anodic and alodine (parts cleaning) line located in building 2-10 and a smaller process line located in building 2-62. Rinse waters were once received from the plating shop in building 2-41. An evaporator-concentrated waste tank holds concentrated chromic acid from the evaporator located nearby. The evaporator-concentrated waste tank is designated as Staging Area 4 in the Part B permit application (Boeing 1985).

The Boeing Company plans to discontinue in June 1992 the process that generates chrome-contaminated water. A closure plan is being prepared for this unit (Whitson 1992).

Dates of Operation

The tanks have been used at Boeing Plant 2 since approximately 1940. The evaporator- concentrated waste tank was regulated under interim status.

Wastes Managed

EPA hazardous waste codes D002 and D007 are managed at this unit. Steam from the evaporator is condensed and discharged to the Metro sanitary sewer system. Concentrated chromic acid generated by the evaporator is shipped off site for disposal at a licensed TSDF. If the evaporator breaks down, chrome-contaminated rinse waters are sent to The Boeing Company's Kent Space Center for treatment. The annual production of chrome-contaminated water is reported to be 178,000 gallons (Boeing 1991). Significant components of the waste stream include chromic acid,

sulfuric acid, and alodine 1200 (chromic acid and potassium ferricyanide). The concentration of chromium in the evaporator tank ranges from 600 to 7,800 parts per million; pH ranges from 0.5 to 2.6 in wastes sent to the TSDF. Chromium concentrations in rinse waters sent to the Kent Space Center range 70 parts per million to 1,200 parts per million; pH ranges from 1.5 to 3.5.

Release Controls

There are no automatic level controls in the chromium waste tanks. A waste handler is responsible for keeping the tank contents below the maximum fill levels. Any leakage or spill from the tanks flows to a waste holding sump located in building 2-10, which also provides spill retention for the anodic and alodine process lines. The secondary containment wall for the chromium acid tank completely contains wastes on all sides of the building.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT spill incident file.

Conclusions Regarding Release Potential

The tanks appeared to be in good condition. The floor also appeared to be in good condition with no visible cracks or stains, and no visible evidence of releases. A sudden large-volume spill would likely flow outside the building. Small spills would flow to the waste holding sump in building 2-10. In the past, small leaks may have occurred, although there is no record of such releases. Information about the design and integrity of the conveyance system and waste holding sump was unavailable at the time of the VSI. Potential exposure of the general population to contaminated soils is low because of the concrete floor and paved surface outside.

Recommendations for Further Investigation

Soil and groundwater beneath the tanks and the conveyance system to building 2-10 should be investigated to determine the nature and extent of contamination, if any.

4.3 SWMU 2-09.3: SPILL SUMP (Photo 2)

A sump is located outside of building 2-09 where chrome-concentrated wastewater is transferred from the evaporator-concentrated chrome waste holding tank into a tanker truck. The waste is hauled off site to a TSDF. The sump collects material that may spill during waste transfer, as well as storm water runoff. A valve at the sump is operated manually to permit storm water collected in

the sump to discharge to the Duwamish Waterway. The valve is kept closed to prevent discharge of spilled material into the Duwamish Waterway.

Dates of Operation

The spill sump has been used at Boeing Plant 2 since at least 1977. It is still in operation.

Wastes Managed

EPA hazardous waste codes D002 and D007 are managed at this unit. Wastes that are transferred include evaporator-concentrated chromium wastewater, and, should the evaporator become inoperable, contaminated chromium rinse water from the alodine lines.

Release Controls

Release controls include a berm and a manually operated valve, which is kept closed except to release storm water collected in the sump. Storm water runoff collected in the sump is discharged into the Duwamish Waterway.

History of Releases

No releases to the environment were reported in the HAZMAT spill incident files.

Conclusions Regarding Release Potential

Small spills may occur at the transfer area during routine truck loading. Any spills would flow into the sump where they would be contained and then removed. Dual use of the sump for spill containment and storm water runoff control likely allows discharge of unknown amounts of chromium-contaminated water into the Duwamish Waterway. In addition, contaminated water contained in the sump may leak to underlying soils through cracks and joints in the sump. Exposure potential of the general public to contaminated sediments and soils is low because of the concrete surfacing.

Recommendations for Further Investigation

Any sediments in the sump should be investigated for contamination under interim action authority. Contaminated sediments should be removed and the sump decontaminated as an interim corrective measure. In addition, soils surrounding the sump and groundwater should be investigated to

determine the nature and extent of contamination, if any. Groundwater should also be investigated. The feasibility of installing a dedicated spill control sump that would eliminate the dual function of the existing sump should also be investigated.

4.4 SWMU 2-10.4: ZYGLO PENETRANT SPRAY BOOTH (Photos 3 and 4)

Zyglo penetrant is used to inspect airplane parts for cracks and other defects. The penetrant is an oil-based fluorescent dye and petroleum naphtha mixture. Airplane parts are sprayed with Zyglo penetrant and rinsed with water in two spray booths. The airplane parts are inspected under ultraviolet light, which illuminates any cracks holding the penetrant dye. Zyglo penetrant and rinse water is collected in a sump with a drain that discharges to the Metro sanitary sewer.

Dates of Operation

The Zyglo spray booths have operated since approximately 1977, or possibly earlier.

Wastes Managed

Zyglo penetrant that drips from the parts, and the rinse water, are discharged directly to the Metro sanitary sewer without treatment. Zyglo penetrant may contain hazardous constituents such as benzene, toluene, and cresols.

Release Controls

A concrete curb directs the penetrant and rinse water to a floor drain that discharges to the Metro sanitary sewer.

History of Releases

Approximately 1,500 gallons of penetrant were released to the Metro sewer and Duwamish Waterway on February 1, 1988. Sprinkler heads inside the building accidentally discharged and washed residual penetrant from the walls and screens over the containment walls and out onto the catwalk under the building. About 200 to 300 gallons of contaminated water were discharged to the Duwamish Waterway; 1,300 gallons were discharged to the Metro sewer.

There is evidence that Zyglo penetrant dye may routinely leak through the floor of building 2-10. Sealant has been applied under the floor of the building over the north boardwalk along the Duwamish Waterway to prevent leakage of Zyglo penetrant.

Conclusions Regarding Release Potential

Zyglo penetrant does not appear to be contained by the building and sanitary drain system. The presence of several coatings of sealant under the floor of the building suggests that Zyglo penetrant leaks through cracks in the building structure. Tides in the Duwamish Waterway would likely wash penentrant spilled onto the rocks into the waterway. The potential for exposure of the general population to Zyglo penetrant is low because of the restricted access to the boardwalk area.

Recommendation for Further Investigation

Soils and groundwater beneath the building and the Zyglo penetrant unit should be investigated to determine the nature and extent of contamination, if any.

4.5 SWMU 2-10.5: PAINT BOOTH AREA (Photos 5 and 6)

Eight wet-paint booths are located in building 2-10. Five are in use and three are decommissioned. Airplane parts are spray painted by hand at the booths.

Paint overspray in the booths is drawn into a wall of cascading water. The paint settles out and forms a sludge at the bottom of the paint booth reservoir. The water and sludge are routinely pumped from the reservoir when the sludge levels become too high. Contaminated water is shipped off site to a licensed TSDF.

Dates of Operation

The spray booths have been operated since approximately 1956.

Wastes Managed

Spent solvent, waste paint, and reservoir water containing paint and paint booth sludge are generated within the paint booths. Spent MEK and substitute solvents, such as 90 percent MEK/10 percent acetone, and 50 percent MEK/50 percent toluene, oil-base paints, and primers are consolidated in 55-gallon barrels. These wastes are taken to building 2-120. Some MEK is recycled in a solvent recycling unit in building 2-120. For a period of time, reservoir water containing paint was transferred to the paint booth waste tanks (SWMU 2-10.6). Currently, the reservoir waters are pumped directly to tank trucks and transferred to a licensed TSDF for disposal. Waste solvent and paint are generated by cleaning of paint guns, barrels, and cans, color changes, unused paint, and

paint thinning procedures. EPA and state dangerous waste codes associated with this SWMU include F005, D007, D008, and WT02.

Release Controls

Release controls include reservoirs that collect paint overspray, paint-contaminated water, and sludge at each paint booth. The volume of the reservoirs was not determined during the VSI. Water in the reservoirs is recirculated, although freeboard above the water level appears limited, which could allow oversplash of reservoir contents.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. However, the floor behind the booths is stained with paint, indicating that the reservoirs have overflowed or material has been routinely spilled during pumping.

Past practices apparently allowed spills onto the floor to go unattended. The present practice is to clean up spills immediately after they are noticed.

Conclusions Regarding Release Potential

Deteriorated concrete or cracks were observed during the VSI, which suggested that spills may have seeped to underlying soils and groundwater. However, the integrity of the concrete floor is unknown. Over the years, paint wastes may have seeped through joints or cracks that were unnoticed during the VSI. The potential for exposure of the general population to contaminated soils beneath the paint booths is low because of the concrete floor.

Recommendations for Further Investigation

Soils and groundwater beneath the paint spray booths should be investigated to determine the nature and extent of contamination, if any.

4.6 SWMU 2-10.6: PAINT BOOTH WASTE TANKS (Photo 8)

Three aboveground tanks were installed outside of building 2-10 to receive paint sludge and waste from the paint booth reservoirs. The largest tank has a 5,0000-gallon capacity. The capacity of the other tanks is not known. The tanks have not been used for 2 months. Currently, paint booth

sludges and wastewaters are pumped directly from the paint booth reservoirs to tanker trucks and hauled off site to a licensed TSDF.

Dates of Operation

The bulk storage tanks were operated as early as 1987.

Wastes Managed

Wastes managed included paint booth water and paint sludges containing solvents, isocyanate paints, and chromate paints. Settled sludges were pumped and shipped to a licensed TSDF. Separated liquids were discharged to the Metro sewer system. EPA and state dangerous waste codes designations associated with this SWMU include D007, D008, F005, and WT02.

Release Controls

Release controls include an uncovered concrete sump, which is located outside. The size and volume of the sump appeared adequate to contain the contents of the tanks.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. There was no evidence of spills observed at this unit during the VSI.

Conclusions Regarding Release Potential

No evidence of spills or cracks in the concrete sump were observed during the VSI. The area around the tanks appeared to be free of stains. The open sump collects rainfall, which is discharged to the Metro storm sewer. Wastes or storm water containing hazardous constituents may have been discharged to the Metro sanitary sewer in the past.

Recommendations for Further Investigation

The unit is relatively new and there is no visible evidence of spills and leaks from the unit. Therefore, no further investigation is recommended.

4.7 SWMU 2-10.7: PAINTSTRIP TANK LINE (Photo 9)

The paintstrip tank line includes three tanks (one stripper tank and two rinse tanks). Nonspecification paint parts were immersed in stripper fosrinse (mixed chromic and phosphoric acids) to remove paint and prepare the parts for repainting. Drips from parts were caught in a sump enclosing the tanks. The wall behind the paintstrip unit is heavily stained with stripping solution that splashed onto the wall. The paintstrip tank line in building 2-10 has recently been shut down.

Dates of Operation

The unit begun in operation in approximately 1956.

Wastes Managed

Acid wastes were generated from change-out processes and small-draws to replenish the solution volume and strength. Acid wastes were stored in the acid hold tank (SWMU 2-31.18). Chromium concentrations in the waste ranged from 300 parts per million to 50,000 parts per million; pH ranged from 1 to 3.5. EPA hazardous waste code designations associated with this SWMU are D002 and D007.

Release Controls

The concrete sump is the primary release control at this unit.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. However, heavy staining suggests that routine releases occurred into the sump, in addition to splashing of stripper solution onto the wall and floor during operations.

Conclusions Regarding Release Potential

Materials were spilled onto the concrete flooring within the building. No cracks were observed; however, the concrete wall and floor and concrete within the sump were heavily stained. Small cracks not readily visible could be conduits for spills to leak to the soil beneath this SWMU. The potential for exposure of the general population to contaminated soils is low because of the concrete floor.

Recommendations for Further Action

Soils and groundwater underlying the tank line should be investigated to determine the nature and extent of contamination, if any.

4.8 SWMU 2-10.8: ANODIC AND ALODINE TANK LINES (Photos 10,11, and 12)

The anodic and alodine tank lines include tanks 3, 5A, 5B, 7A, 8A, and 11. These are large open-topped tanks. Chemical and electroplating processes in the tanks use solutions of chromic acid, alodine, lead rinse, nitric acid deoxidizer, and sulfuric acid anodize. Parts are immersed in the solutions and transferred in a metal basket to other tanks in the series. The dragout procedure allows solution to drip between tanks during parts transfer. Drippage is collected either by drains that are directed to a 1,000-gallon concrete above-grade vault located underneath the tank line or directly into the secondary containment sump below the tanks. The concrete floor of the containment sump is heavily stained and spalled. The tank line was shut down in June 1992 and will be decommissioned in the fall of 1992.

Dates of Operations

The tank lines were operated since approximately 1941.

Wastes Managed

Wastes handled include mixed acids such as chromic acid, sulfuric acid, nitric acid, and hydrofluoric acid with chrome, aluminum, copper, and other metals. Acid wastes are directed to the acid hold tank in building 2-31 (SWMU 2-31.18). EPA and dangerous waste designation codes associated with wastes at this unit are D002, D007, D004, D008 or D010, and WT02.

Release Controls

Release controls include drains between the tanks, and the concrete sump and dry pit. The drains were in disrepair during the VSI. The concrete floor was stained and heavily spalled.

History of Releases

Spills have occurred at the anodic tank line. Chromic acid overflowed on April 16, 1968 and January 16, 1969. A process tank overflowed to the Metro sewer in October 1973. The corroded metal drains

and spalled concrete observed during the VSI indicate that releases were regular and were not immediately cleaned up.

Conclusions Regarding Release Potential

Wastes apparently spilled and dripped routinely during parts transfer, and eroded the surface of the concrete. Soils beneath the concrete may be contaminate if the deteriorated concrete has cracks that penetrate the floor, which would allow fluids to migrate downward. The potential for exposure of the general public to contaminated soils is low because of the concrete floor.

Recommendations for Further Investigation

Soils and groundwater beneath the concrete should be investigated to determine the nature and extent of contamination, if any.

4.9 SWMU 2-10.9: ALUMINUM CHEM MILL AREA (Photo 13)

Aluminum parts are chemically milled in a series of tanks. One tank, which was being repaired during the VSI, was dry. Parts are immersed in sodium hydroxide, triethanolamine, and caustic soda solutions for a period of time. Aluminum is removed from the parts to a selected thickness. Unwanted residue on paints is removed with deoxidizers (chromic acid, hydrofluoric acid, potassium dichromate, and ferricyanide) in other tanks in the same series.

Dates of Operation

The aluminum chem mill has operated since approximately 1960.

Wastes Managed

Acid and caustic waste solutions and sludges are generated at the aluminum chem mill station. Draw-off solutions, drippage, and sludges from the tanks are handled as wastes. The EPA hazardous waste codes associated with this SWMU are listed as D002, D003, and D007 The wastes are transported off site to a licensed TSDF.

Release Controls

A concrete sump provides secondary spill containment.

History of Releases

The HAZMAT spill incident file contains no record of releases to the environment from the aluminum chem mill. However, in the past, drippage from dragout procedures was allowed to accumulate in the sump without routine cleaning.

Conclusions Regarding Release Potential

Spills and drippage into the sump were not regularly cleaned up and were allowed to accumulate. The ability of the sump to contain spills is not known. Over time, it is possible that routine spills seeped through joints or small cracks in the sump to the underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete floor.

Recommendations for Further Investigation

Soils and groundwater beneath the sump should be investigated to determine the nature and extent of contamination, if any.

4.10 SWMU 2-10.10: CONDENSATE RECEIVER TANK (Photos 14 and 15)

Caustic soda and sodium hydroxide used for water treatment were stored in the condensate receiver tank (the capacity of this tank is unknown) in a metal shed located outside of building 2-10. A concrete containment berm surrounds the shed. The floor is freshly coated with a grey paint or epoxy. However, the coating is bubbled, indicating that the floor is reactive to the paint coating, and that routine spills or leaks occurred over time from tanks or tank filling procedures within the building.

Dates of Operation

The shed and tank operated since approximately the 1960s.

Wastes Managed

Strong caustics were managed in this unit.

Release Controls

Release controls include a concrete berm around the shed.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The bubbled paint on the floor indicates that the floor is reactive and is likely contaminated by caustics. Soils beneath the floor may also be contaminated. A drain in the floor is open but its connection is unknown. The potential for exposure of the general population to contaminated soils is low because of the concrete floor.

Recommendations for Further Investigation

Soils and groundwater beneath the floor should be investigated to determine the nature and extent of contamination, if any.

4.11 SWMU 2-10.11: SOLID WASTE COMPACTOR (Photo 16)

A solid waste compactor is located outside building 2-10 near the paint booth waste tanks (SWMU 2-10.6). Solid waste from the plant is dumped into a feed-shoot and is compacted into a transporter container. The compacted solid waste is hauled off site for disposal. The area was clean and free of refuse and trash.

Dates of Operation

The compactor has been operated since approximately 1989 or earlier.

Wastes Managed

General solid waste refuse generated at the plant is typically managed at this unit. Hazardous wastes are not disposed of in the compactor, although in at least one case latex primer paint was placed in the dumpster.

Release Controls

No release controls were evident. The compactor is uncovered. There is no secondary containment berm.

History of Releases

In March 1989, containers of latex primer paint that had been placed into a dumpster spilled onto the ground at building 2-10. The dumpster reported in this incident may have preceded the compactor, or the spill report may have incorrectly identified the compactor as a dumpster. The spill was immediately cleaned up.

Conclusions Regarding Release Potential

There was no visible evidence of releases of hazardous wastes to the environment at this unit. Use of the compactor for hazardous waste disposal is not permitted. The concrete and asphalt surface would likely prevent contamination of soils in the event of a spill. The potential for human exposure to potentially contaminated media is low because of the asphalt and concrete surfacing.

Recommendations Regarding Further Investigation

Further investigation of this unit is not recommended.

4.12 SWMU 2-10.12: SATELLITE AND ACCUMULATION AREAS (Photos 7 and 17)

Before December 1991, there were 26 satellite and accumulation areas associated with building 2-10. Since then, the numbers have been reduced; currently there are two satellite areas and six accumulation areas. One accumulation area was observed during the VSI outside of building 2-10. At this area, six drums used to store hazardous waste were enclosed in a steel shed. Liquid wastes were stored in drums over a secondary containment pan. Solid hazardous wastes were stored in drums on the floor.

Dates of Operation

The present satellite and accumulation areas have operated since December 1991.

Wastes Managed

Waste managed include waste paint and paint solvents, paint stripper, solvent-contaminated rags, and empty cans.

Release Controls

Liquid wastes are stored in steel drums over secondary containment pans. Solid wastes are stored in steel drums equipped with removable plastic liners and closing lids to prevent release of volatile gases.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

There is little risk of release to the environment from the satellite and accumulation areas. No visible staining or spills were observed during the VSI.

Recommendations for Further Investigation

No further investigation is recommended.

4.13 SWMU 2-15.13: BOILER VALVE PIT (Photo 18)

The power plant, which includes the boiler, is located in building 2-15. A boiler valve pit in the building collects oily water, which is pumped from the pit into a mobile tanker and transported to the waste oil collection building (SWMU 2-282.76). The dimensions of the pit were not obtained during the VSI.

Dates of Operation

The dates of operation are not known, but the unit is currently in operation.

Wastes Managed

Oily waters that collect in the bottom of the pit are managed at this unit. These oily waters may contain hazardous constituents.

Release Controls

The pit is inspected visually; there are no automated level alarms to signal overflows.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. In the past, oily waters were allowed to accumulate in the bottom of the pit. The current practice is to promptly remove oily water and clean the pit.

Conclusions Regarding Release Potential

The integrity of the concrete pit is unknown; however the floor appears to be in good condition. Over time, oily wastewaters seeping through cracks or joints in the sump may have contaminated soils underlying the sump. The potential for exposure of the general population to contaminated soils is low because of the concrete floor.

Recommendations for Further Investigation

Soils and groundwater beneath the pit should be investigated to determine the nature and extent of contamination, if any.

4.14 SWMU 2-15.14: BULK STORAGE TANK PIT (Photo 19)

A bulk storage tank pit, located inside of building 2-15, houses an oil/water separator and oil holding tank. The tank and separator are housed in a concrete sump, which is covered with a steel floor plate. The pit was not measured during the VSI. The capacity of the tank is not known.

Dates of Operation

Dates of operation are not known, but the unit is currently in use.

Wastes Managed

Wastes managed include waste oil and water. Water in the oil/water separator is discharged to the Metro sanitary sewer. Waste oil is pumped to the waste oil tank in building 2-282 (SWMU 2-282.76).

Release Controls

The oil tank is equipped with a level-operated valve. The pit is a closed concrete sump.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. Oil has overflowed from the tank into the pit in the past. (Whitson 1992).

Conclusions Regarding Release Potential

The integrity of the concrete sump is unknown, although the concrete appeared to be in good condition. Over time, seepage of oil wastes through joints or cracks in the sump may have contaminated soils underlying the sump. The potential for exposure of the general population to contaminated soils is low because of the concrete floor.

Recommendations For Further Investigation

Soils and groundwater underlying the pit should be investigated to determine the nature and extent of contamination, if any.

4.15 SWMU 2-15.15: OIL COLLECTOR AND TANK (Photos 20 and 21)

An oil collector and tank are located at the automotive shop, building 2-15. Waste oil from trucks and automobiles is drained into an oil collector and pumped to a 1,000-gallon double-walled bulk storage tank located outside of building 2-15. The double-walled tank provides secondary spill containment.

Dates of Operation

Dates of operation are not known, but the unit is currently operational.

Wastes Managed

Waste motor oils are managed at this unit.

Release Controls

The double-walled tank provides secondary spill containment.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The potential for release is low. The tank appeared to be in good condition. The floor area in the shop was clean and free of visible staining.

Recommendations for Further Investigation

No further investigation is recommended.

4.16 SWMU 2-15.16: SATELLITE AND ACCUMULATION AREA (Photo 22)

One container accumulation area is located in the automotive shop. Drums are stored over secondary containment vessels. A blind sump and grate on the floor also provides spill containment. Both solid and liquid wastes are stored in 55-gallon steel drums. Waste drums are transferred to the central staging area (SWMU 2-120.75) when they become full.

Dates of Operation

The present accumulation area has been used since December 1991.

Wastes Managed

Antifreeze and solvents, including 1,1,1-TCE, spray paint, and empty aerosol cans are accumulated in this area.

Release Controls

Accumulation drums are stored on secondary containment pans. The steel drums are lined with removable plastic and are equipped with closing lids to prevent escape of volatiles into the atmosphere.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. The area was clean and no evidence of stains or spills were observed during the VSI.

Conclusions Regarding Release Potential

The potential for release from this unit is low because of the spill containment features and concrete floor.

Recommendations for Further Investigation

No further investigation of this unit is recommended.

4.17 SWMU 2-31.17: AREA A CORROSIVE STORAGE (Photo 23)

Areas A, B, and C at Building 2-31 are adjoining compartments used for storing product and wastes. The compartments are cinder block construction with a concrete floor and metal roof. Area A is designated for storage of corrosives. Product, such as chromic acid, nitric acid, hydrofluoric acid, and sodium hydroxide are stored in Area A. According to facility representatives, some wastes are occasionally stored in drums.

Dates of Operation

The storage shed has operated since approximately 1972 or earlier.

Wastes Managed

Drummed acid wastes are sometimes stored at this unit.

Release Controls

The floor is sloped toward a drain in the middle of the room. The terminus of the drain is not known. A concrete berm at the entrance prevents runoff from entering the storage area and keeps any spill from flowing out of the area. Product and wastes are stored on pallets placed over steel secondary spill containment pans.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Operations and secondary containment features make the release potential at this unit low. No evidence of spills or staining was observed during the VSI.

Recommendations for Further Investigation

No further investigation is recommended.

4.18 SWMU 2-31.18: AREA B ACID WASTE HOLD TANK (Photo 24)

Areas A, B, and C at building 2-31 are adjoining compartments used for product and waste storage. The compartments are cinder block construction with concrete floors and metal roofs.

Area B is designated as an acid waste storage area. It includes a 5,000-gallon bulk acid hold tank and two 500-gallon acid mobile tanks (Photo 24). The acid hold tank is constructed of one-fourth-inch steel plate and is lined with one-eighth-inch PVC to contain waste acids. The mobile tanks are used to collect acid waste from other acid hold tanks at Boeing Plant 2. Rinsate from the mobile tanks is washed into the blind sump and pumped to the 5,000-gallon waste hold tank. The acid waste hold tank is pumped approximately weekly by a licensed disposal contractor, and is transported off site to a licensed TSDF.

Dates of Operation

The holding tank has been in operation for over 20 years. This unit is regulated under interim status.

Wastes Managed

Mixed acid wastes from the plant are collected in two 500-gallon mobile tanks and are stored in the 5,000-gallon acid hold tank. Wastes collected and stored include nitric acid, chromic acid, sulfuric acid, hydrofluoric acid, and hydrochloric acid. EPA hazardous waste code and state dangerous waste code designations for wastes handled at this SWMU are D002, D007, and WT02.

Release Controls

There are no automatic level controls on this tank. The fill level is regulated manually. A concrete sump under the bulk storage tank provides secondary containment. The bulk storage tank is in good condition and the sump under the tank is inspected regularly. In addition, there is a blind sump in the floor of the area where the mobile tanks are stored.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Routine use of the blind sump to collect rinsate from the mobile tanks could result in a release of wastes to the soil and groundwater through cracks or open joints in the concrete. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier and restricted access.

Recommendations for Further Investigation

Soils and groundwater beneath both sumps should be investigated to determine the nature and extent of contamination, if any. Further investigation of the bulk storage tank sump is recommended because of the long-term use of the tank and the uncertainty of the sump's integrity.

4.19 SWMU 2-31.19: AREA C FLAMMABLE STORAGE (Photo 25)

Areas A, B, and C at building 2-31 are adjoining compartments used for storing product and wastes. The compartments are cinder block construction with concrete floors and metal roofs.

Area C is used as a waste accumulation area for solvents such as MEK and xylene and for storage of flammable product. Wastes are stored in steel drums over steel secondary containment pans. The containers are grounded.

Dates of Operation

The storage shed has operated since approximately 1972 or earlier; it is currently in use.

Wastes Managed

Spent paint solvents such as MEK and xylene are stored in steel drums.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Release Controls

The secondary containment pans, in addition to a concrete floor sump at the entrance, provide spill containment.

Conclusions Regarding Release Potential

The potential for release is low because of the secondary containment features of the storage area and the apparent good condition of the concrete floor.

Recommendations for Further Investigation

No further investigation is recommended.

4.20 SWMU 2-31.20: DEACTIVATED CYANIDE HOLD AREA (Photo 26)

The cyanide hold area is a roofed brick-and-concrete structure located outside of building 2-31. The area is deactivated and Boeing Plant 2 has applied to Ecology for closure status. The area was designated as Staging Area 6 in the Part B permit application (Boeing 1985). In the past, the area was used for holding waste cyanide consisting of spent plating solutions from production areas and cyanide wastes from laboratories or research and development operations. Both liquid and semi-solid cyanide wastes were stored in 375-gallon hazardous waste containers.

Dates of Operation

The unit began operation as early as 1941. It is currently inactive and is regulated under interim status.

Wastes Managed

Small quantities of cyanide-solution were consolidated in up to 4,375-gallon cyanide hold tanks. Semi-solid cyanide wastes were also stored in this area before being shipped off site to a licensed TSDF for disposal. Chemical makeup of the wastes was typically copper cyanide and sodium cyanide with pH ranging from 9 to 13. EPA waste code designations for wastes managed at this unit included WT02, D002, D006, D007, D003, and F007.

Release Controls

The waste containers were stored on a floor grate over a 1,500-gallon-capacity concrete secondary spill sump. The unit appeared to be in fair condition. The integrity of the concrete sump could not be determined.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Containers stored in this unit may have leaked into the secondary containment sump. Over time, seepage of wastes through cracks or joints in the concrete may have contaminated soils or groundwater underlying the sump. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier and restricted access.

Recommendations for Further Investigation

Soils and groundwater beneath the sump and structure should be investigated to determine the nature and extent of contamination, if any.

4.21 SWMU 2-31.21: TCE DEGREASER (Photo 27)

The TCE degreaser is a large, closed-top tank in which parts are lowered in a basket to a level below the vapor layer in the tank. TCE vapor condenses on the parts and removes grease and oils. The degreaser tank is located within a concrete sump, which appeared to be in good condition.

Dates of Operation

The degreaser tank has been in operation since approximately 1945.

Wastes Managed

Waste solvent and oil were allowed to accumulate in the pit during operations.

Release Controls

The TCE tank is mounted in a concrete sump that provides secondary containment for spills and drippage from parts during dragout. The current practice is to promptly clean drips and splashes of solvent form the pit.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. Routine drippage from dragout of parts was contained in the sump. Drips are currently cleaned up immediately, but were not in the past.

Conclusions Regarding Potential For Release Potential

Although the concrete appears to be in good condition, solvents may have seeped over time through small cracks or joints in the concrete, and may have contaminated soils underlying the sump. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier and restricted access.

Recommendations for Further Investigation

Soils and groundwater beneath the sump should be investigated to determine the nature and extent of contamination, if any.

4.22 SWMU 2-31.22: BRUSH PLATING AREA (Photo 28)

Parts are cleaned in this area of building 2-31 using chromic acid and alodine solution, which is sprayed on the parts. Rinse is collected in a floor sump and pumped into a mobile tanker through a hose that passes through the wall. The acid waste is taken to the acid hold tank in Area B (SWMU 2-31.18).

Dates of Operation

The unit has been operated since approximately 1941.

Wastes Managed

Wastes managed in this unit are mixed acids.

Release Controls

A floor sump is routinely used to collect the chromic acid cleaning solution. The area is enclosed in the building and is not exposed to weather.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The integrity of the sump is not known. Acid solutions may have seeped through cracks or joints in the concrete, over time, and may have contaminated soil underlying the sump. However, the potential for exposure of the general population to contaminated soils is low because of the concrete floor.

Recommendations for Further Investigation

Soils and groundwater beneath the unit should be investigated to determine the nature and extent of contamination, if any.

4.23 SWMU 2-31.23: AMMONIUM PERSULFATE TANK (Photo 29)

Two tanks that held ammonium persulfate were kept in a room next to the sodium hydroxide developer room in building 2-31. The tanks have since been moved to the Boeing plant in Auburn, Washington. A secondary containment berm enclosed the two tanks to hold waste liquid and keep the floor free of liquids. Developer solution was allowed to accumulate in a sump within the berm.

Dates of Operation

The unit began operation in approximately 1982.

Wastes Managed

Wastewater containing ammonium persulfate was managed at this unit.

Release Controls

A secondary containment berm enclosed the two tanks and a sump was used to routinely collect developer solution.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Although the concrete appears to be in good condition, over time, small cracks or joints in the concrete may have allowed fluids to migrate to the soils underneath this unit. The potential for exposure of the general population to contaminated soils is low because of the concrete floor.

Recommendations for Further Investigation

Soils and groundwater underlying the floor should be investigated to determine the nature and extent of contamination, if any.

4.24 SWMU 2-31.24: SODIUM HYDROXIDE DEVELOPER (Photo 30)

Sodium hydroxide solution was sprayed on parts placed on a rotating wheel. A concrete berm was designed to contain the spray solution. The process, however, resulted in solution being sprayed on the walls and floor outside the bermed areas.

Dates of Operation

The unit began operation in approximately 1982.

Wastes Managed

Waste containing sodium hydroxide was managed at this unit.

Release Controls

A concrete berm enclosed the operating area to keep solution off the floor. There is no sump within the containment berm.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. However, the floor and walls outside the bermed area are heavily stained.

Conclusions Regarding Release Potential

Over time, small cracks and joints in the concrete floor may have allowed fluids to migrate to underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete floor.

Recommendations for Further Investigation

Soils and groundwater underlying the floor should be investigated to determine the nature and extent of contamination, if any.

4.25 SWMU 2-31.25: ANODIZE ALUMINUM ROOM (Photo 31)

Solutions of nitric acid, sulfuric acid, nickel acetate, sodium dichromate, and aluminum were used in electroplating operations in the building 2-31 anodize aluminum room. A series of small electroplating tanks are located over primary and secondary drip containment pans. The drip containment pans do not extend beyond the bench top in which the tanks are mounted. Drips from the benchtop likely accumulated on the floor in the aisles between the tanks.

Dates of Operation

The unit operated since approximately 1941.

Wastes Managed

Mixed wastes of nitric and sulfuric acids containing nickel, sodium dichromate, and aluminum were likely allowed to accumulate on the floor.

Release Controls

The drip containment pans under the benches likely did not catch drippage from the bench top. The rubber mat on the floor likely allowed solutions to collect on the floor.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The integrity of the floor is unknown. Over time, solutions remaining on the floor may have seeped through small cracks or joints into underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete floor.

Recommendations for Further Investigation

Soils and groundwater beneath the tank line should be investigated to determine the nature and extent of contamination, if any.

4.26 SWMU 2-31.26: ANODIZING TANK LINE (Photo 32)

An anodizing tank line for electroplating of parts was deactivated in early March 1992 for renovation. The floor will be decontaminated and sealed and a leak detection system will be installed. The tank line will be reactivated following renovation. Acids dripped from parts removed from the tanks into a concrete sump underneath the tank line.

Dates of Operation

The tank line operated since approximately 1941.

Wastes Managed

Compounds that contributed significantly to waste from the tank line included sodium cyanide, sodium hydroxide, cadmium oxide, cadmium balls, and nickel sulfate. Waste chemical makeup included copper cyanide and sodium cyanide. EPA and dangerous waste code designations for wastes handled at this SWMU include WT01, D002, D006, D007, D003, and F007.

Release Controls

Release controls include a concrete sump. Acids were allowed to collect in the secondary containment sump under the tanks.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The sump appeared to be in poor condition. Repeated spills of cyanide and acid solutions to the sump may have leaked through cracks or joints in the concrete into the underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete surfacing.

Recommendations for Further Investigation

Soils and groundwater beneath the tank line should be investigated to determine the nature and extent of contamination, if any.

4.27 SWMU 2-31.27: SATELLITE AND ACCUMULATION AREAS (Photo 33)

Currently, there are two container accumulation areas in building 2-31. One accumulation area was observed during the VSI. Liquid wastes are stored in 55-gallon steel drums on portable spill containment pans. Solid wastes are stored in 55-gallon steel drums fitted with removable plastic liners and closing lids.

Dates of Operation

The existing container accumulation areas have been operated since 1991.

Wastes Managed

Wastes stored include toluene, MEK, waste acid, and parts contaminated with nitric acid.

Release Controls

Drums for containing liquid wastes are stored over secondary containment pans. Other wastes are stored in steel drums equipped with closing lids and removable plastic liners. The containment pans appeared to provide sufficient capacity for the volume of waste stored in the containers.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The potential for release from the accumulation areas is low. The floor around the accumulation area was free of visible stains or spills.

Recommendations for Further Investigation

No further investigation of these units is recommended.

4.28 SWMU 2-40.28: COOLANT RECYCLING UNIT (Photo 34)

Coolant used in the machining of parts is recycled in the coolant recycling unit. Oil and water are separated from the coolant and are stored in the 5,000-gallon wastewater hold tank in building 2-83 (SWMU 2-83.59). The recycling unit is enclosed by a concrete secondary containment berm.

Dates of Operation

The unit has been operated since approximately 1972.

Wastes Managed

Water contaminated with coolant and lubricating oil is managed at this unit.

Release Controls

A concrete curb around the unit provides secondary spill containment.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

No evidence of spillage of coolant in the area was observed during the VSI. The work area is kept clean. Waste oil and water are recovered from the recycling tanks and is transferred to the waste hold tank. The concrete curb provides secondary containment. However, the containment area serves as a work area and it is unlikely that wastes were allowed to collect in the secondary containment area. There was no evidence of routine spills or staining.

Recommendations for Further Investigation

No further investigation is recommended because the secondary containment structures were not used routinely to collect wastes.

4.29 SWMU 2-41.29: TCE DEGREASER (Photo 35)

The TCE degreaser is a large, closed-top tank in which parts are lowered in a basket to a level below the vapor layer in the tank. TCE vapor condenses on the parts and removes grease and oils. The degreaser tank is located in a concrete sump.

Dates of Operation

The unit has been operated since approximately 1941.

Wastes Managed

Waste solvent and oil have been released into the sump when parts were removed from the degreaser unit. Currently, wastes released into the sump are cleaned out immediately.

Release Controls

The tank is in a concrete sump about 30 feet deep, which appeared to be in good condition and free of oils and stains.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Although the concrete appeared to be in good condition, seepage of solvents over time through small cracks or joints in the concrete sump may have contaminated soils underlying the sump. The potential for exposure of the general population to contaminated soils is low because of the concrete structure.

Recommendations for Further Investigation

Soils and groundwater beneath the sump should be investigated to determine the nature and extent of contamination, if any.

4.30 SWMU 2-41.30: MANHOLE VAULT

A concrete manhole vault in building 2-41 accumulates rusty, oily wastewater. The source of the water is unknown, although it is suspected to be from a hydraulic press. The vault provides access to pipes from the physical plant in building 2-41.

Dates of Operation

The dates of operation of this unit are unknown.

Wastes Managed

Oily wastewater is managed at this unit, but it is unknown whether it contains hazardous constituents. Facility personnel explained that the oily wastewater was tested and found to contain no contaminants; however, results of the laboratory tests were not made available.

Release Controls

The concrete vault contains water and oil. The vault is inspected regularly. Concrete in the vault appeared to be in good condition.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Although concrete in the manhole vault appeared to be in good condition, over time, seepage of oily wastes through small cracks and joints in the concrete may have contaminated soils underlying the vault. The potential for exposure of the general population to contaminated soils is low because of the concrete structure and restricted access.

Recommendations for Further Investigation

Soils and groundwater beneath the vault should be investigated to determine the nature and extent of contamination, if any.

4.31 SWMU 2-41.31: MACHINE PITS (Photos 36, 37, and 38)

Six machine pits are located in building 2-41. The machine pits are concrete sumps that collect lubricating oils that drip from cutting machines and presses. For some machines, the sumps are also used to recirculate coolant through the machines. Periodically, coolant in the sumps is pumped out and taken to the coolant recycling unit (SWMU 2-42.28). The concrete in all machine pits appeared to be in good condition. Evidence of staining and oily residue was observed in the pits.

Dates of Operation

These units have been operated since approximately 1947.

Wastes Managed

Waste managed include lubricating oils and coolants.

Release Controls

There are no special release controls. The pits are closed concrete structures without outlets.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Although the concrete in the pits appeared to be in good condition, over time, oils and coolant in the sumps may have seeped through small cracks or joints in the concrete and contaminated underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete floor and restricted access.

Recommendations for Further Investigation

Soils and groundwater beneath the sumps should be investigated to determine the nature and extent of contamination, if any.

4.32 SWMU 2-41.32: DEACTIVATED PAINT BOOTHS AND SUMP (Photos 39 and 40)

A series of three deactivated paint booths and a sump are located in building 2-41. Airplane parts were passed in front of the booths on a conveyer system for painting. Paint overspray was collected in a curtain of water within the paint booth. The water was recirculated from a reservoir. A small sump associated with the unit allows access to pipes below the floor. No water was observed in the wet booth reservoirs and the sump was dry. The concrete floor and sump both appeared to be in good condition.

Dates of Operation

This unit operated since approximately 1956.

Wastes Managed

Wastes managed included MEK, toluene, acetone, and paints.

Release Controls

There are no automated release controls. The paint booth reservoirs were visually inspected during operations for leaks and spills.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Paint stains on the floor and around the sump indicate that paint-related wastes were spilled onto the floor during operations. The integrity of the sump is unknown. Although the condition of the concrete is good, overtime paint wastes may have seeped through small cracks or joints in the sump into underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete floor.

Recommendations for Further Investigation

Soils and groundwater beneath the paint booth and sump should be investigated to determine the nature and extent of contamination, if any.

4.33 SWMU 2-41.33: DEACTIVATED ANODIC TANK LINE

Both acidic chrome-contaminated process baths and alkaline chrome-contaminated process baths were used for plating parts at this tank line. Currently, the anodic tank line is inactive with the exception of two tanks that are used to test Maskant in the chem etching process. A coating of Maskant is used to protect the aluminum part from the etching process. Currently, the two tanks hold a solution of toluene, water, trace ammonia, and proprietary solids. In the past, drippage from parts transfer was contained in the concrete sumps around the tanks.

Dates of Operation

This unit operated since approximately 1941.

Wastes Managed

Chromium-contaminated wastes from small draws from the process baths were consolidated in tanks and shipped to an off-site TSDF. Two tanks in the tunnel area below (SWMU 2-4.34) held wastes generated at the tank line. Chromium concentrations in waste ranged from 500 parts per million to 1,200 parts per million; pH ranged from 2.8 to 10. Other metal contaminants included cadmium, lead , nickel, zinc, and copper. Waste code designations for materials handled at this SWMU include D002, D006, D007, and D008.

Release Controls

Drips and spills were routinely collected in sumps located beneath the tanks. The condition of the concrete sumps could not be observed during the VSI because of the surface grating. However, the tanks and grating were corroded and heavily stained; and it is likely that the underlying concrete is in a similar condition.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Mixed acid and alkaline wastes in the sumps have seeped through cracks and joints in the concrete and formed mineralized deposits on the ceiling in the tunnel area below (SWMU 2-41.34). This is evidence that other concrete sumps may allow contaminants to seep into underlying soils at other SWMUs. The potential for exposure of the general population is low because of the concrete covering and restricted access.

Recommendations for Further Investigation

The integrity of the concrete structure between the tank line area and tunnel area below should be investigated to determine the relationship of the SWMUs and the potential for soil contamination.

4.34 SWMU 2-41.34: TUNNEL AREA (Photos 41 and 42)

Chromic acid solutions from the deactivated anodic tank line (SWMU 2-41.33) were held in two small tanks occupying the tunnel area below. Seepage of solutions from the floor above formed mineralized deposits on the ceiling and walls of the room in which the tanks are housed.

Dates of Operation

This unit was operated since approximately 1941.

Wastes Managed

Mixed acid wastes including chromic acid and metals were managed at this unit.

Release Controls

No secondary containment berms or sump were provided at the tanks.

History of Releases

No releases to the environment were reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Formation of mineralized deposits on the ceiling and walls indicates that joints in the concrete allow migration of fluids from the tank line above. Similar joints may be located in the floor in the tunnel area; this would allow migration of fluids to underlying soils.

Recommendations for Further Investigation

Soils and groundwater beneath the tunnel area should be investigated to determine the nature and extent of contamination, if any.

4.35 SWMU 2-41.35: QUENCH TANKS (Photos 43 and 44)

Parts are heated on a salt bed furnace and quenched in a series of three tanks, which are mounted in a sump with metal grating. Drippage from removal of parts from the tanks collects in the sump.

Dates of Operation

The unit was operated since approximately 1936.

Wastes Managed

Wastewater containing metals is managed at this unit.

Release Controls

A concrete sump provides secondary spill containment and containment of drippage from parts removal. The concrete sumps appeared to be in good condition.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Drippage from drag out of parts collects in the sumps during the quenching process. Although the concrete appeared to be in good condition, over time, small cracks in the concrete may have allowed contaminated water to seep into the underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete floor and sump.

Recommendations for Further Investigation

Soils and groundwater beneath the sumps should be investigated to determine the nature and extent of contamination, if any.

4.36 SWMU 2-41.36: UNDERFLOW FLUME

An underground flume connects the deactivated anodic tank line (SWMU 2.41.33) to the outside of the building and the Duwamish Waterway. Waste from the tank line may have been discharged into the flume in the past. Engineering specifications of the flume are not available; however, water is present in the bottom. Cyanide waste may have been discharged through the flume to the Duwamish Waterway.

Dates of Operation

The flume operated since approximately 1941. It is not known when discharges to the Duwamish River were discontinued; although this may have occurred in the 1950s or 1960s.

Wastes Managed

Cyanide wastes and chromic acid wastes from the anodic tank line may have been discharged in the flume.

Release Controls

The use of the flume is not entirely understood. Nothing is known about methods used to control releases of hazardous waste. The condition of the flume, particularly fittings and joints, is unknown.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. However, in the past wastes were apparently discharged to the Duwamish Waterway as standard practice.

Conclusions Regarding Release Potential

Residues likely remain in the flume and may be a source of contaminants in soils around the flume and in groundwater.

Recommendations for Further Investigation

Water present in the bottom of the flume should be investigated to determine the presence of any contamination. Soils and groundwater beneath the flume should also be investigated to determine the nature and extent of contamination, if any.

4.37 SWMU 2-41.37: PAINT BOOTH WASTE TANK

A 5,000-gallon-capacity tank in building 2-41 was used to store paint waste from the paint booths on the second floor. The tank is located on a concrete floor. The concrete is in good condition. The tank is not currently used.

Dates of Operation

The tank may be 20 years old.

Wastes Managed

Paint wastes and sludges from three paint booths upstairs were stored in this tank during change-out of contaminated water from the booth reservoirs.

Release Controls

The tank is double-walled, providing secondary containment.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. There was no visible evidence of leaks or stains.

Conclusions Regarding Release Potential

The tank is located in a highly traveled area and is readily visible. Any leak would be noticed. The tank is on a concrete floor inside the building. There was no evidence of routine or systematic releases of wastes from the tank.

Recommendations for Further Investigation

No further investigation is recommended.

4.38 SWMU 2-41.38: SATELLITE AND ACCUMULATION AREAS

In the past, there were up to 25 container management areas in building 2-41. As of December 1991, there are nine container accumulation areas and two satellite areas. Steel drums are fitted with removable plastic liners and closing lids for storing solid hazardous wastes, or with closed tops for storing liquid wastes. The drums are stored on secondary containment pans.

Dates of Operation

The present satellite and accumulation areas have operated since 1991.

Wastes Managed

Solvents, lubricating oil, cleaning rags, and absorbent materials are stored at the satellite and accumulation areas.

Release Controls

Steel drums with closing lids and removable plastic liners are used to store solid hazardous waste. Liquids are stored in closed drums over secondary containment pans.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The potential for release is low. Two accumulation areas in building 2-41 were observed during the VSI. The areas were clean and free of visible stains or spills.

Recommendations for Further Investigation

No further investigation is recommended.

4.39 SWMU 2-44.39: SATELLITE AND ACCUMULATION AREAS

In the past, there were up to 24 container management areas in building 2-44. Currently, there are 11 accumulation areas in this building. There are no satellite areas used. Solid hazardous wastes are stored in steel drums fitted with removable plastic liners and closing lids. Liquid wastes are stored in drums with closed tops. The drums are stored over secondary containment pans.

Dates of Operation

The present accumulation areas have operated since 1991.

Wastes Managed

Solvents, lubricating oils, cleaning rags, and absorbent materials are stored in the container management areas.

Release Controls

Steel drums with closing lids and plastic liners are used to store solid hazardous waste. Liquids are stored in closed drums over secondary containment vessels.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The potential for release is low. None of the accumulation areas in building 2-44 was observed during the VSI. However, these areas are operated in a manner similar to all other accumulation areas and are located within a building with restricted access.

Recommendations for Further Investigation

No further investigation is recommended.

4.40 SWMU 2-49.40: MACHINE PIT

Two stretch presses are located in this building. The machines have 750- and 500-ton ratings, and are mounted in large pits (about 40 feet deep at one end). The 500-ton machine has been sold and is being dismantled.

Dates of Operation

The unit has operated since approximately 1941.

Wastes Managed

Oil from the machines was routinely allowed to leak into the sumps underneath the presses. Currently, oil leaks are cleaned up when they are detected. Satellite drums are used to collect oily rags generated from the breakdown and repair of the one remaining press.

Release Controls

The machines are mounted in large machine pits (about 40 feet deep at one end).

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The concrete pits appeared to be in good condition; however, waste lubricating oils were allowed to accumulate in the pits and may have seeped overtime through small cracks or joints in the concrete to the underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete covering.

Recommendations for Further Investigation

Soils and groundwater beneath the pit should be investigated to determine the nature and extent of contamination, if any.

4.41 SWMU 2-49.41: SATELLITE AND ACCUMULATION AREAS

In the past, there were up to nine container management areas in building 2-49; currently there are two accumulation areas and one satellite area in this building where wastes generated by the machines and toolmaking processes are collected and accumulated. The solid wastes are stored in steel drums fitted with removable plastic liners and closing lids. Liquid wastes are stored in drums with closed-top lids.

Dates of Operation

The present satellite and accumulation areas have operated since 1991.

Wastes Managed

Solvents, lubricating oil wastes, cleaning rags, and absorbent materials are stored in the container management areas.

Release Controls

Steel drums with closing lids and plastic liners are used to store solid hazardous waste. Liquids are stored in closed drums over secondary containment vessels.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The potential for release is low. One satellite area was observed during the VSI. The area around the drums was clean and free of stains. Lids on the drums were closed.

Recommendations for Further Investigation

No further investigation is recommended.

4.42 SWMU 2-59.42: MATERIAL STORAGE AND WASTE ACCUMULATION (Photos 45 and 46)

Product and wastes are stored in containers and drums in building 2-59, which is built of cinder block with a concrete floor. The floor space within the building is approximately 30 feet by 20 feet. Product is stored on shelves in small containers. Steel drums are used for accumulating wastes. Approximately seven 55-gallon steel drums were present at the time of the VSI.

Dates of Operation

Dates of operation are not known.

Wastes Managed

Recyclable waste (MEK) stored in this building is transferred to building 2-120 to be reprocessed. Other wastes include oily rags, oily wastes, and absorbent materials.

Release Controls

The floor slopes toward a sump with a drain that is plugged with concrete. The sloped floor and sump are the only release controls. The steel drums are stored directly on the floor without secondary containment.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The potential for release to the environment is low. Wastes are stored properly in containers that are in good condition. The floor and the storage area were clean with no visible staining from spills or other evidence of routine or systematic releases. The concrete floor appeared to be in good condition.

Recommendations for Further Investigation

No further investigation is recommended.

4.43 SWMU 2-62.43: TANK LINE (Photo 47)

Metal parts are chemically cleaned (pretreated) for painting in this tank line. Parts are pretreated in sodium metal sulfide and sodium phosphate solution, and in chromic acid and sodium fluoborate solution. The parts are rinsed with water. A sump is used to collect wastewater from the tank line. No stains were observed outside of the sump during the VSI. The tank line and concrete structures were in good condition and appeared to be well maintained at the time of the VSI.

Dates of Operation

This unit has operated since approximately 1945.

Wastes Managed

Wastes managed at this unit consist of chromium-contaminated rinse water. Chromium concentrations range from 95 parts per million to 8,000 parts per million; pH ranges from 0.7 to 6.5. Rinse water from the cleaning process is stored in the bulk storage tank adjacent to the tank line (SWMU 2-62.44).

Release Controls

A concrete sump collects rinse water, which is pumped into the bulk storage tank.

History of Releases

Routine use of the sump for collecting acid rinsate from the tank line may have allowed contaminated rinse water to seep over time through cracks or joints in the concrete into underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater beneath the sump should be investigated to determine the nature and extent of contamination, if any.

4.44 SWMU 2-62.44: BULK RINSE WATER STORAGE TANK (Photo 48)

Chromic acid-contaminated rinse water from the tank line is stored in this 5,000-gallon synthetic bulk storage tank. The tank is located at the end of the tank line. A concrete wall surrounds the tank and provides secondary containment.

Dates of Operation

The date of operation of the tank is unknown.

Wastes Managed

Rinse waters contaminated with sodium metal sulfide, sodium phosphate, chromic acid, and sodium fluoborate are held in the tank. The wastes are pumped and transported to a licensed TSDF for disposal.

Release Controls

Release controls include a concrete secondary containment wall around the storage tank.

History of Release

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The tank and secondary containment wall appeared to be in good condition. There is no evidence of routine or systematic releases from the tank.

Recommendations for Further Investigation

No further investigation is recommended.

4.45 SWMU 2-62.45: PAINT BOOTHS AND SUMP (Photo 49)

Airplane parts are painted at four wet paint booths in building 2-62. Paint overspray is directed into a curtain of recirculated water, which is contained in a water reservoir.

Dates of Operation

The unit has operated since approximately 1945 and is still in use.

Wastes Managed

Oil-based paint and paint solvents accumulated in the reservoirs from which water was recycled to the paint booth. The water was periodically pumped out and changed over.

Release Controls

No release controls other than visual inspections were in place during operations.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. However, past practices allowed paint-contaminated water in the reservoirs to overflow onto the floor.

Conclusions Regarding Release Potential

Paint wastes and solvents spilled onto the floor may have seeped over time through small cracks or joints in the concrete into the underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater beneath the booths should be investigated to determine the nature and extent of contamination, if any.

4.46 SWUM 2-62.46: SATELLITE AND ACCUMULATION AREAS (Photo 50)

Currently, there are two satellite and accumulation areas for wastes from the paint booths and chemical conversion processes in building 2-62. At one satellite area, a single 30-gallon and a single 55-gallon drum are used to store waste rags, filters, MEK, acetone, and chromium paint wastes. The drums are located near the paint booth area.

Dates of Operation

The existing satellite and accumulation areas have been operated since 1991.

Wastes Managed

Wastes stored in drums at the satellite and accumulation areas consist of rags, filters, MEK, acetone, chromium paint waste, and paint cans.

Release Controls

Solid hazardous waste is stored in lined drums with closing lids. Liquids are stored in closed drums over a secondary spill containment vessel.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. The area was clean and free of visible stains or other evidence of spills.

Conclusions Regarding Release Potential

The potential for release to the environment is low.

Recommendations for Further Investigation

No further investigation is recommended.

4.47 SWMU 2-63.47: DILUTE CHROME TANK (Photo 51)

Dilute chromic acid wastewater was stored in a tank within a concrete bermed area. The tank size was not identified during the VSI. The tank was removed and will be replaced with drums. Dilute chromic acid wash-off from model making was stored in the tank. The drums that will replace the tank will be used to store the chromic acid wastewater.

Dates of Operation

Dates of operation are unknown.

Wastes Managed

Dilute chromic acid wastes were managed at this unit.

Release Controls

The tank was located within a concrete berm. The new drums will also be located within the bermed area. No staining was evident on the floor outside of the bermed area. The concrete appeared to be in good condition.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Although the concrete appeared to be in good condition, chromic acid wastes may have seeped overtime through small cracks or joints within the bermed area to underlying soils. The potential for exposure of the general public to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater beneath the bermed area should be investigated to determine the nature and extent of contamination, if any.

4.48 SWMU 2-64.48: UNDERGROUND WASTE TANK (Photo 52)

Oily water is stored in an underground waste tank outside Building 2-64. The oily water comes from the air compressor in building 2-64 and from storm water catch basins. The tank size is not known. The oily wastes are transferred to the bulk waste oil tank (SWMU 2-91.69) for off-site disposal at a TSDF.

Dates of Operation

Dates of operation are unknown.

Wastes Managed

Oily wastewater is managed at this unit.

Release Controls

Release controls at this SWMU are unknown.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The condition and integrity of the tank are unknown. Cracks or pinholes may be present in the tank wall, which could release oily wastewater to the surrounding soils. The potential for exposure of the general population to contaminated soils is low because of the paved surface overlying the tank.

Recommendations for Further Investigation

The underground tank should be pressure tested to determine its integrity. If necessary, soils and groundwater surrounding the tank should be investigated to determine the nature and extent of contamination, if any.

4.49 SWMU 2-64.49: AIR COMPRESSOR BUILDING AND ACCUMULATION AREA (Photo 53)

Compressed air for the plant is generated in building 2-64. Condensate water containing oils is stored in two aboveground tanks. The volumes of the tanks were not available during the VSI. Wastes generated from routine maintenance of equipment, such as oily rags and paints, are also placed in drums at an accumulation area in this building. The drums are stored over a secondary containment pan. The compressors, floor, and room were clean and in good condition.

Dates of Operation

Dates of operation are unknown.

Wastes Managed

The condensate water contains oil residues. Wastes in the tanks are shipped off site to a licensed TSDF for disposal.

Release Controls

Release controls were not identified during the VSI.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

In the past, the general housecleaning practices were poor and leaks of oils and water were not cleaned up. Over time, small cracks and joints in the concrete may have allowed fluids to seep to underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater beneath the unit should be investigated to determine the nature and extent of contamination, if any.

4.50 SWMU 2-65.50: MACHINE PIT

A parts grinding machine and machine pit are located in building 2-65. Machine coolant is recycled through the machine. A 55-gallon drum was located near the machine. Coolant, resulting from malfunctions of the coolant recycle system, was stored in the drum. Coolant had been spilled into the machine pit and cleaned up. The machine pit is not typically used to contain coolant for recycling. The concrete appeared to be in good condition.

Dates of Operation

The unit has operated since approximately 1940.

Wastes Managed

Ethylene glycol and lubricating oil are handled at this SWMU.

Release Controls

The concrete machine pit is used to collect lubricating oils that drip from the machine; it also serves as the collection point for coolant in case of a spill.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. In the past, coolants and lubricating oils were collected in the machine pit and were not routinely or promptly removed.

Conclusions Regarding Release Potential

Although the concrete appeared to be in good condition, lubricating oils and coolant may have seeped over time through small cracks and joints in the concrete to underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater below the sump should be investigated to determine the nature and extent of contamination, if any.

4.51 SWMU 2-65.51: SATELLITE AND ACCUMULATION AREAS

Seven container management areas were located in building 2-65 prior to December 1991. Two container accumulation areas and one satellite area are used to support machining operations in the building. Wastes generated at the machine process areas are stored in steel drums at the satellite and accumulation areas.

Dates of Operation

The present container management areas have operated since 1991.

Wastes Managed

Waste solvents, lubricating oils, and rags are stored in drums in the satellite and accumulation areas.

Release Controls

Solid hazardous wastes are stored in steel drums with closing lids and removable plastic liners. Liquids are stored in closed drums over secondary containment pans.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The potential for release to the environment is low because of the storage practices and secondary containment.

Recommendations for Further Investigation

No further investigation is recommended.

4.52 SWMU 2-66.52: MACHINE PIT

Coolant used by the deburring machine was collected in a concrete machine pit (sump) and recycled. During the VSI, the sump appeared to be clean. The deburring machine had been removed.

Dates of Operation

Dates of operation were not identified during the VSI.

Wastes Managed

Various coolants were used over time in the machining process.

Release Controls

Wastes were allowed to accumulate in the sump without cleaning.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. The concrete machine pit appeared to be in good condition.

Conclusions Regarding Release Potential

The concrete sump was built to contain coolant. Over time, small cracks or joints in the concrete may have allowed fluids to seep to underlying soils. The potential for exposure of the general population to potentially contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater beneath the sump should be investigated to determine the nature and extent of contamination, if any.

4.53 SWMU 2-66.53: TCE DEGREASER (Photo 54)

Small aluminum flat stock is immersed in the TCE degreaser tank to remove oil film that protects the part from corrosion. The tank is located in a concrete pit. The size of the tank was not recorded during the VSI.

Dates of Operation

This unit has operated since approximately 1945.

Wastes Managed

Spent TCE and oil are managed at this unit.

Release Controls

A concrete pit under the degreaser contains spills.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

In the past, drippage of solvent from dragout of parts was allowed to accumulate in the pit. Currently, the pit is cleaned out when spills occur. Over time, small cracks or joints in the concrete

may have allowed TCE and oil to seep to underlying soils. The potential for human exposure to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater surrounding the pit should be investigated to determine the nature and extent of contamination, if any.

4.54 SWMU 2-66.54: SATELLITE AND ACCUMULATION AREAS

Three satellite accumulation areas support machining processes in building 2-66. Steel drums are used to collect liquid and solid hazardous wastes generated at the process sites.

Dates of Operation

The present container management areas have operated since December 1991.

Wastes Managed

Wastes consist of oils and solvent-soaked rags and absorbent materials.

Release Controls

Solid hazardous wastes are stored in steel drums equipped with removable plastic liners and closing lids. Liquid wastes are stored in steel drums with closed tops over a secondary containment pan.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The potential for release is low. No accumulation or satellite areas were observed in building 2-66 during the VSI. However, all such units are operated similarly. Operating procedures and practices followed at the accumulation and satellite areas substantially reduce the potential for release.

Recommendations for Further Investigation

No further investigation is recommended.

4.55 SWMU 2-70.55: EAST STEAM CLEAN AND UNDERGROUND BULK STORAGE TANK (Photo 55)

Equipment and vehicles are washed with a high pressure hose and steam cleaned in a metal shed. The wash water is collected in an underground bulk storage tank located near the steam clean facility.

Dates of Operation

Dates of operation are unknown.

Wastes Managed

Wastes managed include water containing oil and grease, detergent, and grit.

Release Controls

A concrete floor slopes to a catch basin that collects runoff from the steam clean shed. The runoff flows into a 5,000-gallon underground storage tank, which is a converted oil/water separator. The catch basin is located outside without any cover. The wash water is periodically pumped and shipped off site for disposal.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The age and condition of the catch basin and underground tank are not known. Therefore, the potential for release of contaminants from the catch basin and tank into the environment cannot be assessed. Cracks or pinholes leaks in the tank welds may allow contaminants to migrate into surrounding soils. The potential for exposure of the general population to contaminated soils is low because of the surface paving.

Recommendations for Further Investigation

Soils and groundwater surrounding the tank should be investigated to determine the nature and extent of contamination, if any.

4.56 SWMU 2-80.56: SINK SUMP (Photo 56)

A concrete sump under a sink in the plaster shop in building 2-80 is used to hold water and plaster sludge, which is produced during the preparation of plaster molds. Water from the sump is discharged to the Metro sanitary sewer. Sludge is tested for toxicity characteristic leachate procedure metals and disposed of accordingly.

Dates of Operation

This unit has operated since approximately 1940.

Wastes Managed

Strong alkaline waste possibly containing metals, is managed at this SWMU.

Release Controls

Process water is controlled by a sump in the floor of the work area. A metal grating covers the sump. The sludge collected in the sump is shipped off site to a licensed TSDF for disposal. Wastewater is discharged to the Metro sanitary sewer.

History of Releases

Wastewater is routinely discharged to the Metro sanitary sewer. There are no recorded releases to the environment from the unit.

Conclusions Regarding Release Potential

Small cracks and joints in the concrete sump may have allowed fluids to seep to the underlying soils over time. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater under the unit should be investigated to determine the nature and extent of contamination, if any.

4.57 SWMU 2-80.57: GENERATOR SUMP (Photo 57)

The aircraft generator test room contains concrete sump located underneath the generators to catch leaks during change-out of oil from the coolant pumps used during testing procedures. The generators are water or air cooled. Oil is changed out monthly.

Dates of Operation

This unit has operated since approximately 1940.

Wastes Managed

Waste lubricating oils are managed at this unit. The waste lubricating oils may contain hazardous constituents.

Release Controls

Drippage is collected in a sump under the generators.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. In the past, oil was routinely allowed to collect in the sump. The area was not in operation during the VSI. The room was clean and no evidence of oily residues was observed.

Conclusions Regarding Release Potential

Routine use of the sump to collect oil drippage may have allowed waste lubricating oils to seep through small cracks or joints in the concrete into the underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater underlying the unit should be investigated to determine the nature and extent of contamination, if any.

4.58 SWMU 2-80.58: DEACTIVATED SUMP (Photo 58)

The quenching tanks in which steel was hardened are deactivated. The tanks rest on a metal grating over sumps, which were dry at the time of the VSI. In the past, dragout of parts from the tanks allowed water, possibly containing metals and oil, to drip into the sumps.

Dates of Operation

This unit was operated since approximately 1936.

Wastes Managed

Water, possibly containing oil and metals from the quenching process, were managed at this unit.

Release Controls

The sumps had no release controls.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Small cracks or joints in the concrete may have allowed contaminated fluids to migrate to the underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater beneath the sumps should be investigated to determine the nature and extent of contamination, if any.

4.59 SWMU 2-83.59: BULK WASTE STORAGE TANK (Photo 59)

A 5,000-gallon aboveground steel tank at building 2-83 is used to store oily wastewater, which is collected from the plant area in 500-gallon mobile tanks and is then transferred to the bulk storage tank in building 2-40. The bulk storage tank is mounted on concrete supports. A storm drain is located next to the tank. A secondary containment pan and absorbent pads are located below the tank fill spout. The oily wastewater is pumped into a tanker truck and shipped to a licensed TSDF for disposal.

Dates of Operation

The unit was operated since approximately 1972.

Wastes Managed

The tank holds oily wastewater collected from sumps and other areas of the plant.

Release Controls

There is a fluid level indicator on the outside of the tank, which is visible to operators. The level indicator is checked whenever a waste load is delivered to the tank. In addition, the tank is double-walled, providing secondary spill containment. A second tank and sump, SWMU 2-83.60, provide backup in case the bulk storage tank is overfilled.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The tank appeared to be in good condition. The potential for a spill is low. The ground around the tank appeared to be clean and free of stains. However, failure of the double-walled tank or overflow of oily wastewater during filling operations would release fluid to the Metro storm drain system. There is no structure around the tank to prevent an overflow from reaching the catch basin.

Recommendations for Further Investigation

No evidence of recent or past spills was apparent during the VSI. The unit is highly visible and is in good condition. No further investigation is recommended.

4.60 SWMU 2-83.60: BULK STORAGE TANK SUMP SYSTEM (Photo 60)

A bulk storage tank and sump system is located inside building 2-83 to provide additional storage capacity for SWMU 2-83.59. The unit consists of a 500-gallon synthetic tank and a secondary containment wall.

Dates of Operation

This unit has operated since approximately 1972.

Wastes Managed

Oily wastewater is managed at this SWMU.

Release Controls

A concrete containment wall around the tank provides secondary containment.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The potential for release is low. The spill contaminant area was clean; no stains were apparent.

Recommendations for Further Investigation

No further investigation is recommended.

4.61 SWMU 2-83.61: SATELLITE AND ACCUMULATION AREAS (Photos 61 and 62)

Three container management areas existed prior to December 1991. Currently, there are three accumulation areas and one satellite area that serve toolmaking and painting operations in building 2-83. Two accumulation areas were observed during the VSI. The accumulation area in the paint booth and sanding booth area consists of three drums, two with closing lids and one for containing liquids. The drum for containing liquid waste is placed over a secondary containment pan and is chained to prevent overturning. The second accumulation area consists of four drums with closing lids.

Dates of Operation

The present accumulation areas have operated since December 1991.

Wastes Managed

Wastes managed include acetone, MEK, resins, hardeners, paint rags, and sanding grit.

Release Controls

Release controls include secondary containment vessels for drums containing liquid waste. Removable plastic liners and closing lids are used in drums containing solid waste. The floor area around the drums was clean and free of visible stains and spills.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The potential for release to the environment is low.

Recommendations for Further Investigation

No further investigation is recommended.

4.62 SWMU 2-84.62: MACHINE PIT

Boeing personnel identified two machine pits in building 2-84 but these pits were not observed during the VSI. However, the operation and history of the machine pits are likely similar to other machine process areas in other buildings at the facility. Currently, any spilling or drippage of oils into the pits is cleaned up and the pits are kept dry. In the past, spills and drippage were allowed to accumulate in the pits.

Dates of Operation

This unit has operated since approximately 1940, or earlier.

Wastes Managed

Oily wastes that drip from the machines and machine coolant are managed here. In the past, oily wastes were routinely allowed to accumulate in the pits.

Release Controls

Only the pit serves to control drips; there is no secondary containment.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Over time, small cracks or joints in the concrete may have allowed fluids to migrate to the underlying soils. The potential for human exposure to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater beneath the pit should be investigated to determine the nature and extent of contamination, if any.

4.63 SWMU 2-86.63: WET PAINT BOOTH

The wet paint booth was deactivated the week before the VSI. Water remains in the reservoir and will be pumped out. Overspray from painting was directed into a curtain of recirculating water from the reservoir tank. The curtain of water collected the overspray into the reservoir. The reservoir was pumped out when the paint residue in the water became excessive.

Dates of Operation

This unit was operated since approximately 1956.

Wastes Managed

Paints, solvents, and contaminated rags were generated at this unit, in addition to the paint booth water containing paint waste and paint sludge.

Release Controls

Visual inspections were the only method used to monitor the level of water and sludge in the reservoirs.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. In the past, wastewaters were permitted to collect on the floor in back of the booth.

Conclusions Regarding Release Potential

In the past, spills and leaks during change-out of water in the reservoir were not cleaned up. Small cracks or joints in the concrete may have allowed fluids to migrate to the underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater beneath the unit should be investigated to determine the nature and extent of contamination, if any.

4.64 SWMU 2-86.64: SATELLITE AND ACCUMULATION AREAS

Eight former container management areas were located in building 2-86 prior to December 1991. Currently, two accumulation areas support toolmaking and painting operations in the building. No accumulation areas were observed during the VSI.

Dates of Operation

The present accumulation areas have operated since December 1991.

Wastes Managed

Paint wastes, including solvents and oily rags, are managed at this unit.

Release Controls

Steel drums used to store solid waste are filled with removable plastic liners and closing lids. Liquid wastes are stored in steel drums over a secondary containment pan.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The unit is operated similarly to other satellite and accumulation areas at the plant. Therefore, the potential for releases to the environment is low.

Recommendations for Further Investigation

No further investigation is recommended

4.65 SWMU 2-87.65: MACHINE PIT

Boeing identifies one machine pit in building 2-87. This pit was not observed during the VSI. However, the operation and history of the machine pit is similar to other machine process areas in other buildings at Plant 2. Currently, any oil spilled or dripped into the pit is cleaned up and the pit is kept dry. In the past, spills and drippage were allowed to accumulate in the pit.

Dates of Operation

This unit has operated since approximately 1940, or earlier.

Wastes Managed

Oily wastes that dripped from the machines and coolant are managed at this unit.

Release Controls

Only the pit served to control drips; no other containment is present.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Over time, small cracks or joints in the concrete may have allowed fluids to migrate to the underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater beneath the pit should be investigated to determine the nature and extent of contamination, if any.

4.66 SWMU 2-87.66: SATELLITE AND ACCUMULATION AREAS

Building 2-87 was not visited during the VSI. Four container management units were operated in building 2-87 prior to December 1991. Currently, one container management accumulation area is operated to support manufacturing processes.

Dates of Operation

The existing accumulation area has operated since December 1991.

Wastes Managed

Wastes managed were not identified during the VSI.

Release Controls

Release controls include removable plastic liners and closing lids for drums used to store solid wastes. Liquid wastes are stored in drums and placed over a secondary containment vessel.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The unit is operated in a manner similar to other satellite and accumulation areas at the plant. Therefore, the potential for releases to the environment is low.

Recommendations for Further Investigation

No further investigation is recommended.

4.67 SWMU 2-89.67: WASTE COOLANT TANK (Photo 63)

Waste coolant is stored in a double-walled tank outside building 2-89. The tank holds between 350 and 500 gallons. The tank is mounted on skids, and is in good condition. A storm drain is located within 50 yards of the tank.

Dates of Operation

The dates of operation were not provided during the VSI, although the tank appears to be relatively new.

Wastes Managed

Waste coolants are stored in the tank.

Release Controls

The tank is double-walled. There is no containment around the tank to hold coolant spilled during filling; however the double wall provides secondary containment in the event of a leak in the tank.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Overfilling the tank could result in a release of waste coolant to the Metro sanitary sewer system. The tank is in good condition and the potential for leakage is low. The area underneath and around the tank showed no visible signs of spills or leaks from the tank.

Recommendations for Further Investigation

No further investigation is recommended

4.68 SWMU 2-89.68: RECLAMATION YARD (Photos 64, 65 and 66)

Metal shavings from cutting operations are stored in the open reclamation yard in skid-mounted tubs. One large transport container holding shavings was also observed in the yard. Shavings of brass, copper, and aluminum are stored in the tubs and in the transport container. Storm water runoff from the yard surface is collected in catch basins connected to the oil/water tank at building 2-91 (SWMU 2-91.69).

Dates of Operation

This unit has operated since approximately 1940.

Wastes Managed

Metal shavings are stored for recycling. Oils and coolants from cutting operations are associated with the metal shavings. The oils and coolants may contain hazardous constituents.

Release Controls

There are no controls to prevent rainfall from washing coolant and oil from the shavings onto the ground. The catch basin in the yard collects runoff and directs it to an oil/water separator (SWMU 77) adjacent to the bulk waste oil tank (SWMU 2-91.70). However, coolant is not separated from the water by the oil/water separator; coolant is discharged in the storm water to the Metro sanitary sewer.

History of Releases

It was observed during the VSI that rain had washed coolant from the shavings onto the pavement. Surface water on the pavement around the tubs had been discolored by coolant mixing with the runoff. Drip pans had been placed under the transport container to catch coolant being washed from cuttings in the container. On October 31, 1991, Metro indicated in an inspection report to Boeing Plant 2 management that the amount of cooling water discharged to the sanitary sewer should be reduced. The Metro report also noted that the metal shavings tubs were covered with plastic, and that there were no noticeable spills or oil films on yard surfaces. During the VSI, no plastic covers were observed.

Conclusions Regarding Release Potential

Coolant is regularly released to the Metro sanitary sewer.

Recommendations for Further Investigation

Metro personnel should be contacted about the releases and the apparent departure from Metro's findings during the October 31, 1991 inspection. In addition, the open tubs containing metal shavings should be fitted with covers. Soils and groundwater in the reclamation yard area should be investigated to determine the nature and extent of contamination, if any.

4.69 SWMU 2-91.69: BULK WASTE OIL TANK (Photo 67)

A 3,500-gallon steel tank located near building 2-91 and the reclamation yard is used to store waste cutting oils. Oil separated in the oil/water separator (SWMU 77) is also stored in the bulk waste oil tank, which appears to be in good condition. Waste oil in the tank is pumped to a tanker truck and shipped off site to a licensed TSDF as needed.

Dates of Operation

This unit has operated since approximately 1972, and is currently regulated under interim status.

Wastes Managed

Waste lubricating oils are handled at this unit.

Release Controls

A concrete sump under the tank provides secondary spill containment.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. No evidence of stains or spill was observed during the VSI.

Conclusions Regarding Release Potential

The potential for release to the environment is low because the tank is in good condition and secondary containment is provided.

Recommendations for Further Investigation

No further investigation is recommended.

4.70 SWMU 2-91.70: DEACTIVATED WASTE OIL AND COOLANT HOLD AREA

Building 2-91, a metal shed, was operated as a free and soluble waste oil and waste coolant hold area. The unit was closed down in 1988. There are two steel storage tanks (2,500 and 1,000 gallons). Covers are placed over the empty tanks and entry to the shed is controlled by a chain link fence. A floor grate and a 3,100-gallon concrete sump are also located the building. The building floor is concrete, which is old and cracked.

Building 2-91 was designated as Staging Area 2 in the Part B permit application (Boeing 1985). A closure plan is currently being prepared for the unit.

Dates of Operation

This unit was operated from approximately 1970 until 1988.

Wastes Managed

The tanks were used for collection of waste oils and coolants.

Release Controls

The floor is sloped and curbed to contain and direct spills into spill collection sump located in the building. No automatic controls were provided.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. Soil below the structure has been sampled and tested; results of this testing will be used in preparing the closure plan. The soils investigation for the closure plan was not made available by the Boeing Company. High groundwater seeps into the sump and is regularly pumped out and taken to building 2-282 (SWMU 2-282.76).

Conclusions Regarding Release Potential

Waste oil and coolants in the sump have likely contaminated groundwater and soils surrounding the sump. Further investigation of groundwater and soils at this unit may be unnecessary, however, considering that a closure plan is being prepared for the facility. If it is determined that the site assessment conducted in support of closure plan preparation has not adequately determined the nature and extent of contamination, additional investigations should be undertaken.

4.71 SWMU 2-104.71: CENTRAL DRUMMED WASTE STAGING AREA

Building 2-104 is a concrete shed used to store contaminated wastes that will be recycled. The shed has four compartments, each with a separate containment trench and concrete berm. Wastes are stored on pallets in polypropylene and steel drums. Wastes are collected from Plant 2 and from other Boeing facilities in the Seattle area. The area is designated as Staging Area 1 in the Part B permit application (Boeing 1985).

Dates of Operation

The unit has operated since approximately 1982, and is currently regulated under interim status.

Wastes Managed

Four types of hazardous wastes are stored in the shed: flammable materials generated during painting, cleaning, and degreasing operations; corrosive and oxidizing materials generated in laboratories and during research and development activities, small production operations, and maintenance operations; poisons generated by removal of semi-solid impurities and filter materials produced by cyanide plating operations; and any spilled material that collects in the retention basins. All wastes are sent off site to a licensed TSDF for disposal.

In addition, the shed is used as a drum recycling area. Empty drums that may contain sulfuric acid, xylene, or coolants are stored before shipment to manufacturers for reconditioning.

Release Controls

Release controls include floor trenches and berms in each waste storage compartment.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The potential for releases to the environment is low because of the containment trenches and the facility design.

Recommendations for Further Investigation

No further investigation is recommended.

4.72 SWMU 2-108.72: WET PAINT BOOTH (Photo 68)

The wet paint booth collects overspray from paint spraying. Water in the reservoir is recirculated until the amount of paint in the water renders it ineffective in trapping paint. The reservoir is pumped when the water becomes too paint-laden. The floor behind the booth is stained with paint residue.

Dates of Operation

This unit has operated since approximately 1956.

Wastes Managed

Wastewater contaminated with paint solvents and icocyanate, lacquers, and laytex paints are managed at this unit.

Release Controls

There are no release controls in effect.

History of Releases

No releases from this unit to the environment are recorded in the HAZMAT files. In the past, spills and leaks occurred during change out of water from the reservoir to the floor behind the booth. The spills were not routinely cleaned up.

Conclusions Regarding Release Potential

Small cracks or joints in the concrete may have allowed fluids to migrate to the underlying soils. The potential for exposure of the general population to contaminated soils is low because of the concrete barrier.

Recommendations for Further Investigation

Soils and groundwater beneath the paint booth area should be investigated to determine the nature and extent of contamination, if any.

4.73 SWMU 2-108.73: PAINT BOOTH SUMP (Photo 69)

The paint booth sump in Building 2-108 contains overflow from the wet paint booth (SWMU 108.72). Water was observed in the sump during the VSI; however this was believed to be from floor washdown, not from water reservoir overflow. The floor is stained with paint residue.

Dates of Operation

This unit has operated since approximately 1956.

Wastes Managed

During operation of the wet paint booth, the sump collected water containing isocyanate, lacquers, and latex paints.

Release Controls

Releases to the sump are visually inspected. There are no automated release controls.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

Over time, water in the sump may have been released to the underlying soils through cracks and joints in the concrete. The integrity of the sump is not known.

Recommendations for Further Investigation

Soils and groundwater beneath the sump should be investigated to determine the nature and extent of contamination, if any.

4.74 SWMU 2-108.74: SATELLITE AND ACCUMULATION AREAS

Before December 1991, there were two container management areas in building 2-108. Currently, there is one accumulation area for collecting hazardous waste at the paint booth area.

Dates of Operation

The present accumulation area has operated since December 1991.

Wastes Managed

Waste paints, solvents, and rags contaminated with isocyanate, lacquers, and latex paints and solvents are managed at this unit.

Release Controls

Drums holding liquid waste are stored on secondary containment vessels. Drums holding dry wastes are equipped with removable plastic liners and closing lids.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. The accumulation area was free of visible stains and other evidence of spills.

Conclusions Regarding Release Potential

The release potential is low.

Recommendations for Further Investigation

No further investigation is recommended.

4.75 SWMU 2-120.75: CENTRAL STAGING AREA (Photo 70 and 71)

Hazardous wastes accumulated in drums at the different process areas, and some bulk wastes are consolidated at building 2-120. Wastes are shipped off site within 90 days from their accumulation start date (Art Whitson, Supervisor, The Boeing Company, personal communications to Kit Walther, PRC, March 17, 1992).

Dates of Operation

Dates of operation were not identified during the VSI.

Wastes Managed

There are five areas for accumulation of hazardous wastes, divided according to Washington Department of Transportation hazard class specifications. Wastes stored in these areas include acids, alkalines, paint, solvents, and oils.

History of Releases

There is no record of releases to the environment from this unit, which was observed to be clean with materials stored in an organized manner. No stains or other evidence of spills were observed.

Release Controls

Release controls include a sloped floor and sump at the entrance of each divided area, in addition to a sump in the unload area. The unit is equipped with an audio and visual alarm system and two pumps to remove materials from the sumps.

Conclusions Regarding Release Potential

The potential for release of hazardous waste to the environment is low because of the release controls.

Recommendations for Further Investigation

No further investigation is recommended.

4.76 SWMU 2-282.76: WASTE OIL COLLECTION BUILDING (Photo 72)

Waste oil and coolant formerly stored in building 2-91 is now stored in building 2-282 in a 1,500-gallon mobile steel tank. Hydraulic oil is stored in two 500-gallon upright synthetic tanks. Waste oils and coolant are pumped out and shipped to a licensed TSDF for disposal. The tanks and building structure were in good condition.

Dates of Operation

This unit has operated since 1988.

Wastes Managed

Waste oil and coolant are managed at this unit.

Release Controls

A concrete berm around the floor and a ramped entry contain potential spills inside the building and prevent storm water runoff from entering into the building. The floor and walls are concrete; the floor is sealed.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files. The unit was clean and free of stains and other visible evidence of releases.

Conclusions Regarding Release Potential

The release potential to the environment is low because of the structural design and the secondary containment system.

Recommendations for Further Investigation

No further investigation is recommended.

4.77 SWMU 77: PCB RETENTION TANKS

PCB retention tanks have been removed from three transformer vaults at Boeing Plant 2. Transformer vault 9 is located between buildings 2-62 and 2-63. Transformer vault 15 is located between buildings 2-62 and 2-65. Transformer vault 19 is located east of building 2-87.

Dates of Operation

The transformer vaults were apparently installed in 1980. The tanks for vaults 9 and 15 were removed in 1986. The tank for vault 19 was removed in 1990.

Wastes Managed

Storm water runoff from the transformer pads was collected by drains and directed to the retention tanks. Wastes likely included storm water containing total petroleum hydrocarbons and polychlorinated biphenyls.

Release Controls

Information provided by Boeing Company personnel did not describe release controls.

History of Releases

There is no record of releases to the environment from these tanks.

Conclusions Regarding Release Potential

Reports documenting removal of the tanks and the investigation of potentially contaminated soils at the transformer vaults were unavailable. Soils surrounding the tanks may contain contaminants associated with storm water runoff, but this cannot be confirmed using available information.

Recommendations for Further Investigation

Soils and groundwater beneath the vaults and surrounding the tanks should be investigated to determine the nature and extent of contamination, if any.

4.78 SWMU 78: Oil/Water Separators

There are at least eight oil/water separators (also referred to as oil retention basins) at Boeing Plant 2. The oil/water separators collect storm water runoff and oil or solvent in the event of an uncontrolled spill. Oil from the separators is regularly pumped out and shipped off site to a licensed TSDF for disposal. Storm water from the oil/water separators is discharged to the Metro sanitary sewer.

78.1 Metro separator 2. Metro separator 2 is located at the bulk waste oil hold tank (SWMU 2-91.69). The oil/water separator receives runoff from the reclamation yard. Oil from the separator is pumped into the bulk waste oil hold tank. Water from the separator is monitored using automated instrumentation for oil and grease and is discharged to the Metro sanitary sewer.

78.2 **Separator 7.** Oil/water separator 7 was located near building 2-02. It was removed with the demolition of buildings 2-01 and 2-02.

78.3 **Separator 8.** Oil/water separator 8 could not be located during the VSI. Boeing personnel stated that this oil/water separator may have been relocated to the area near building 2-108.

78.4 **Separator 16.** Oil/water separator 16 is located on the east side of building 2-05. Oily water was observed through the catch basin grate during the VSI.

78.5 **Separator 19.** Oil/water separator 19 is located between buildings 2-82 and 2-95.

78.6 **Separator 20.** Oil/water separator 20 is located on the south side of building 2-51.

78.7 **Separator 21 and 22.** Oil/water separators 21 and 22 are located northwest of building 2-15 within the secondary containment for the fuel storage tanks.

Dates of Operation

Some oil/water separators were operational after the early 1940s. Others were operational after the early 1950s.

Wastes Managed

Waste oils that may have contained hazardous constituents are managed in the oil/water separators.

Release Controls

The oil/water separators are visually inspected and pumped as needed.

History of Releases

No releases to the environment from this unit are reported in the HAZMAT incident files.

Conclusions Regarding Release Potential

The age and condition of the separators are not known. Improper maintenance or cracks and pinhole leaks in welded joints could result in releases of oil and solvent to the surrounding soils and groundwater.

Recommendations for Further Investigation

Soils surrounding the separators should be investigated to determine the nature and extent of contamination, if any.

4.79 SWMU 79: CISTERN SUMPS

Before 1955, Boeing personnel disposed of liquid waste chemicals in five 1,000-gallon cistern sumps located in the southeastern corner of Boeing Plant 2. The cisterns were lined with porous brick that were laid without mortar in the vertical joints to allow the liquid to filter to the soil and groundwater. The cisterns were 5 feet in diameter, 7 feet deep, and were located about 1,000 feet east of the Duwamish Waterway.

In September 1986, the cisterns and the surrounding backfill were removed. Soils from within and surrounding the cisterns were chemically tested. Groundwater was also tested and a groundwater monitoring program was implemented for an environmental assessment (Landau 1987b). However, it is unclear from information obtained from the files if remediation of these cisterns has been successfully completed. A soil and groundwater study of the southeast Boeing Plant 2 area is in progress; results were not available for the RFA.

Dates of Operation

The cisterns were used at Boeing Plant 2 during the 1940s until 1955.

Wastes Managed

The wastes managed in these cisterns were mildly acidic and alkaline solutions (Landau 1986).

Release Controls

There were no release controls; wastes infiltrated from the cisterns into soil and groundwater (Landau 1986).

History of Releases

Wastes dumped into the cisterns infiltrated the soil and groundwater for 10 to 15 years, until 1955.

Conclusions Regarding Release Potential

Since waste chemicals were released into soils and groundwater from the cisterns, additional information about the clean-up action is needed to determine if soil and groundwater contamination was remedied.

Recommendations for Further Investigation

Soils and groundwater in the area of the cistern sumps should be investigated to determine the nature and extent of any remaining contamination if documentation of past clean-up activities is unavailable.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Seventy-nine SWMUs have been identified at Boeing Plant 2. The majority are located within buildings having concrete floors and sumps. With a few exceptions, the present condition of the buildings, concrete floors, and sumps appears to be good. However, small cracks and open joints may be present that were not apparent during the VSI. Over a period of 56 years, industrial processes have been conducted at Plant 2. The plant infrastructure has been repaired and modified over time. The long-term history of plant conditions, for the most part, is unrecorded; structural details of floors, sumps, pits, and containment structures are not readily available. In addition, materials have been spilled and leaked within process areas over the years. Although the concrete is in good condition for the most part, it is most likely not impervious to liquids. Therefore, there is the potential that routine spills have seeped into the underlying soil and groundwater through small cracks or open joints in concrete surfaces within process and waste storage areas. The potential for releases (high, medium, or low) at most units cannot be reliably estimated; however, past releases of hazardous constituents to the soil and possibly to the groundwater are likely at many SWMUs, considering the age and past materials handling practices at the plant.

For these SWMUs, recommendations are made for further investigation to determine the nature and extent of possible contamination of soils and groundwater. At other SWMUs, it appears unlikely that waste management practices have released contaminants to the environment.

Based on an evaluation of each SWMU, no further action under corrective action authorization is recommended for the following 34 SWMUs:

- 2-10.6 Paint booth waste tank
- 2-10.11 Solid waste compactor
- 2-10.12 Satellite and accumulation areas
- 2-15.15 Oil collector and tank
- 2-15.16 Satellite and accumulation areas
- 2-31.17 Area A corrosive storage
- 2-31.19 Area C flammable storage
- 2-31.27 Satellite and accumulation areas
- 2-40.28 Coolant recycling unit
- 2-41.37 Paint booth waste tank
- 2-41.38 Satellite and accumulation areas
- 2-44.39 Satellite and accumulation areas
- 2-49.41 Satellite and accumulation areas

- 2-59.42 Material storage and waste accumulation area
- 2-62.44 Bulk rinse water storage tank
- 2-62.46 Satellite and accumulation areas
- 2-65.51 Satellite and accumulation areas
- 2-66.54 Satellite and accumulation areas
- 2-83.59 Bulk waste storage tank
- 2-83.60 Bulk waste storage tank sump system
- 2-83.61 Satellite and accumulation areas
- 2-86.64 Satellite and accumulation areas
- 2-87.66 Satellite and accumulation areas
- 2-89.67 Waste coolant tank
- 2-91.69 Bulk waste oil tank
- 2-91.70 Deactivated waste oil and coolant hold area
- 2-104.71 Drummed waste staging area
- 2-108.74 Satellite and accumulation area
- 2-120.75 Central staging area
- 2-282.76 Waste oil collection building

Further investigation is recommended at the remaining SWMUs in order to characterize the nature and extent of potentially contaminated soils and groundwater. Exposure of the general population to contaminated soils and groundwater underlying these units is low because of restricted public access, active site management practices, concrete and asphalt surfacing, and other controls; therefore, it is recommended that investigations be deferred until plans for demolition or renovation of buildings are implemented at Boeing Plant 2. Currently, The Boeing Company is conducting remedial investigations at buildings 2-10, 2-09, and 2-15 in preparation for removal of these buildings. All investigations should include soil sampling and analysis, estimates of contaminated soil volumes, and groundwater sampling and analysis. Clean-up levels, if warranted, should also be recommended. These investigations may be conducted as part of an RFI for each individual SWMU or for an individual building. Specific recommendations for each SWMU are presented in Section 4.0. The nature and extent of potentially contaminated soils and groundwater should be investigated at the following units:

- 2-01.1 Landing gear cleaning sump
- 2-09.2 Chrome waste tanks
- 2-09.3 Spill sump
- 2-10.4 Zyglo penetrant spray booth
- 2-10.5 Paint booth area
- 2-10.7 Paint strip tank line

- 2-10.8 Anodic and alodine tank lines
- 2-10.9 Aluminum chem mill area
- 2-10.10 Condensate receiver tank
- 2-10.13 Boiler valve pit
- 2-15.14 Bulk storage tank pit
- 2-31.18 Area B acid waste hold tank
- 2-31.20 Deactivated cyanide hold area
- 2-31.21 TCE degreaser
- 2-31.22 Brush plating area
- 2-31.23 Ammonium persulfate tank
- 2-31.24 Sodium hydroxide developer
- 2-31.25 Anodize aluminum room
- 2-31.26 Anodizing tank line
- 2-41.29 TCE degreaser
- 2-41.30 Manhole vault
- 2-41.31 Machine pits
- 2-41.32 Deactivated paint booths and sump
- 2-41.33 Deactivated anodic tank line
- 2-41.34 Tunnel area
- 2-41.35 Quench tanks
- 2-41.36 Underflow flume
- 2-49.40 Machine pit
- 2-62.43 Tank line
- 2-62.45 Paint booths and sump
- 2-63.47 Dilute chrome tank
- 2-64.48 Underground waste tank
- 2-64.49 Air compressor and accumulation area
- 2-65.50 Machine pit
- 2-66.52 Machine pit
- 2-66.53 TCE degreaser
- 2-70.55 East steam clean and underground bulk storage tank
- 2-80.56 Sink sump
- 2-80.57 Generator sump
- 2-80.58 Deactivated sump
- 2-84.62 Machine pit
- 2-86.63 Wet paint booth
- 2-87.65 Machine pit
- 2-89.68 Reclamation yard

- 2-108.72 Wet paint booth
- 2-108.73 Paint booth sump
- 77 PCB retention tanks (vaults 9, 15 and 19)
- 78 Oil/water separators (Metro separator 2 and oil separators 7, 8, 16, 19,20, 21, and 22)
- 79 Cistern sumps

In addition, interim measures should be implemented at some SWMUs to avoid potential contamination of soils and groundwater or the potential for release of contaminants to the environment should be further investigated. Specifically, interim measures are recommended for the following units:

SWMU	Description	Interim Measure
2-09.3	Spill sump	Sample sediments and decontaminate sump, if appropriate.
2-10.8	Anodic and alodine tank lines	Conduct engineering evaluation of secondary containment sump and dry vault because of poor concrete condition.
2-10.9	Aluminum chem mill	Conduct engineering evaluation of secondary area containment sump because of poor concrete condition.
2-31.26	Anodizing tank line	Conduct engineering evaluation of secondary containment sump.
2-41.33	Deactivated anodic tank line	Conduct engineering evaluation of secondary containment sump because of poor concrete condition.
2-41-36	Underflow Flume	Sample water in the flume and investigate the integrity of the flume because of the presence of standing water.
2-89.69	Reclamation yard	Fit storage tubs with covers to prevent rain from washing coolant and oil onto surface.

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